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THE

Dental Summary

EDITED BY

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REGULAR CONTRIBUTIONS

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL January 1920 No. 1

TEMPORARY BASES AS A SUBSTITUTE FOR STITCHING

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"YOU MAY pull teeth; you may extract teeth; or you may remove them by a surgical operation." These are the three possibilities mentioned by Franklin W. McCormack, of San Francisco at a recent meeting of our local dental society. Undoubtedly, this statement expresses the relative importance accorded the subject of extraction by the dentists of our country. Without intending any disparagement it may be said that the general practitioner pulls teeth, the specialist extracts them, while the oral surgeon surgically removes them. While this may be true as a rule, it is entirely possible for both general practitioner and specialist as well as the oral surgeon to remove teeth surgically. However, the writer has the first mouth yet to examine from which teeth and sufficient process have been properly removed by either of the first two procedures named, unless specific directions previously have been given in order to secure the results desired by the prosthetist.

Since the prosthetist usually does not regard himself as in position to refer the patient to any particular exodontist, the only possibility of securing the mouth conditions that he desires lies in an opportunity that may be given to offer a few suggestions to the exodontist before he removes the teeth.

As a safeguard and in order to help the prosthetist in the alignment of the teeth in the proposed denture for the patient, it is wise to secure an impression of the natural teeth before they are removed. In order to facilitate the replacing of the teeth after removal the technic of modeling compound impression taking is here varied to the following extent: The compound is placed in a suitable tray and allowed to chill until, under most circumstances, it would be too cold for impression taking. At this juncture the entire surface is coated with white vaseline

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*This is the first of a series of twelve articles being written by Dr. Campbell, for the 1920 volume DENTAL SUMMARY.

or Nujol and the entire surface of the case superheated over a flame for a second or two only. This is placed in the mouth and pressed up until the greatest bucco-lingual diameter of the teeth is reached, when the impression is held until chilled. The tray is now easily removed and there is no dragging of the compound, not to mention especially the ease with which the teeth may be replaced in the impression—a process that is very trying with the usual "good" modeling compound or plaster impression. After the teeth are cleaned and dried and one or two teeth are placed in proper position, the embrasures and portions of impression purposely omitted in the process of taking impression are filled in with base-plate wax. This procedure is continued until all of the teeth are in place, when the case will appear as in *Fig. 1*, ready to be poured with plaster.

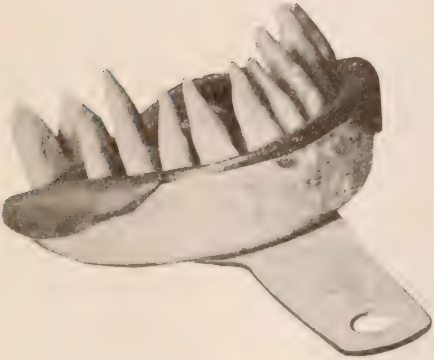

Fig. 1

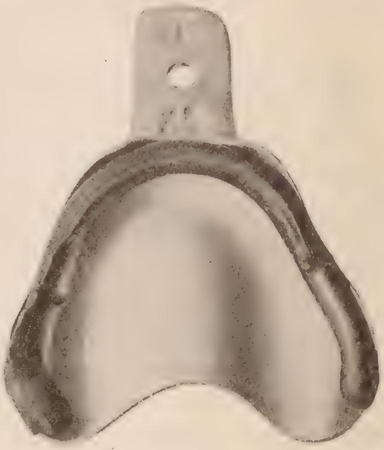

Fig. 2

Fig. 1—Patient's natural teeth placed in modeling compound impression which was taken before teeth were removed.

Fig. 2—Tray with roll of Kerr's Modeling Compound adapted.

The suggestions to be offered to the exodontist are not new, but to the contrary are regularly followed by some who seem not to have lost interest in every other phase of extraction except the time and fee elements. One extractor told me very frankly that he did not care to take cases which required "so much time." Where the opportunity is afforded, the writer is in the habit of suggesting the technic that is followed by our leading oral surgeons, namely, the curettement of diseased sockets, a liberal excision of the buccal and labial plates especially in the incisal and molar regions, and a free stripping back of the periosteum to a point beyond the actual place of smoothing off the process, so that when the tissue heals no irregular ledge of bone tissue will remain to defeat the real object of the operation. After the gum tissue has been trimmed away with the shears until the fluted or scalloped edge has been straightened and until the labial and palatal portions when brought over towards each other lack about four millimeters of coming together, these usually are stitched together.

At this stage, the writer wishes to offer a substitute for the stitching process, because at every point where the needle is inserted for a stitch there is caused a scar and subsequent cicatricial tissue, which he believes does not receive kindly the base upon which the new teeth are to be provided. As far as the time element is concerned, furnishing a substitute for the stitching process does not require much more time, if any, than the stitching itself.

A suitable Britannia metal tray is filled with a soft roll of Kerr's Modeling Compound and adapted to the buccal and labial flanges of the tray as shown in *Fig. 2.*

After superheating the surface of the compound, this is placed in the patient's mouth and moderate pressure applied while the cheeks and lips are massaged back into as nearly normal position as possible.

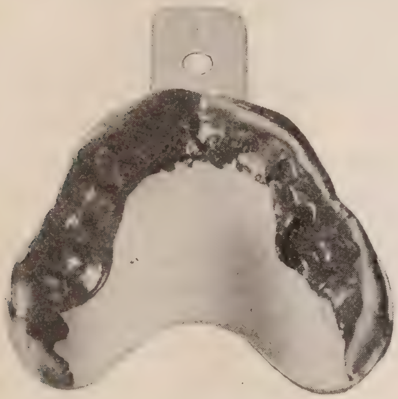

Fig. 3

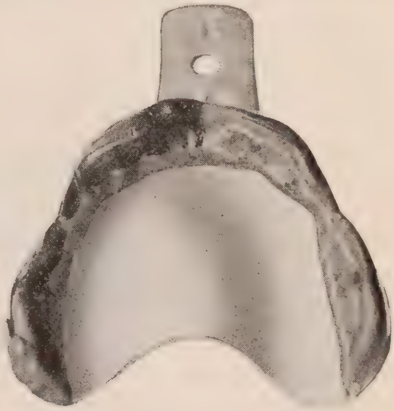

Fig. 4

Fig. 3—Impression of bucco-labial portion.
Fig. 4—Bucco-labial impression after trimming.

When the compound is cold the tray is removed and the resulting surface will then resemble that shown in *Fig. 3.*

The dentist should not be alarmed if the compound has run into the tooth sockets and even over upon the labial portion of the mouth. All of the labial portion and the impression of the tooth sockets over as far as what we may continue to term the buccal gingiva (this buccal gingiva has in reality been cut away) is cut away, after which the case appears as shown in *Fig. 4.*

A mass of the same impression material is heated until pliable but not until too hot and is shaped into a cone; after drying the tray, the base of the cone is softened with dry heat and stuck to the vault of the tray as shown in *Fig. 5.* This new portion of the compound also is superheated, care being taken not to allow it to become too soft since it is desired that the tissue be compressed toward the crest of the ridge. The

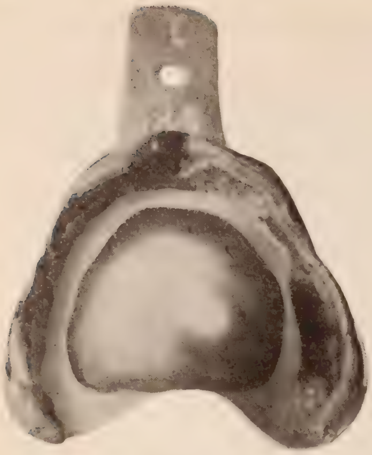

Fig. 5

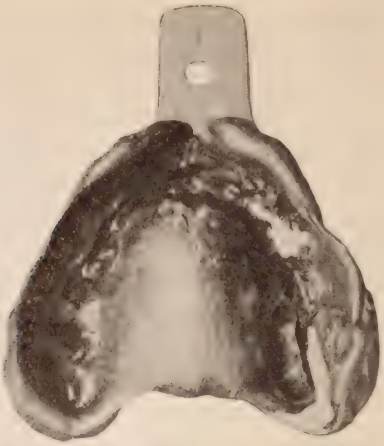

Fig. 6

Fig. 5—Cone shaped mass of modeling compound ready for palatal impression.
Fig. 6—Upper after impression of tooth sockets have been cut out.

tray should not be pushed or shoved unduly into place; a gentle but firmly-directed pressure should be exerted toward the ears. After the compound is cold (the writer prefers to wait rather than use ice water) the impression is removed in a condition resembling *Fig. 6.*

In the event that the edges of the compound do not meet, no cognizance should be taken of this fact until the cast is poured, at which time it is possible to "fake" the union to make it resemble a continuity of tissue. The writer may here interpolate, that it has been his experience that few dentists have the courage to cut out of their impressions the impressions of the tooth sockets, and this is notoriously true of men who send their cases to commercial laboratories. Mouths that would have been in incomparably better condition if the impression had not been taken until the sockets had filled with granulation tissue, are, through such lack of courage, left in a ragged condition; and the ridges are left

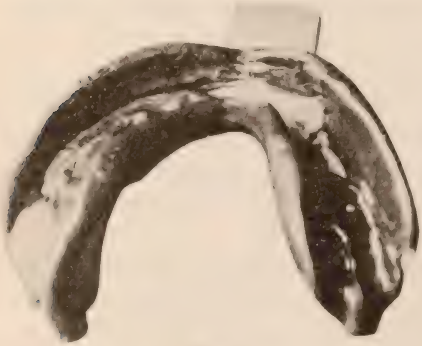

Fig. 7

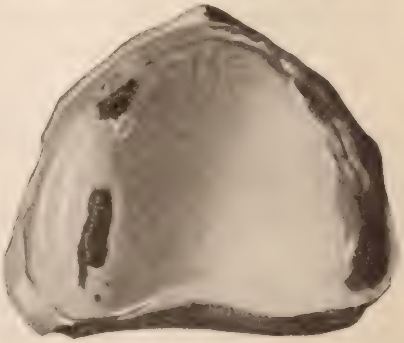

Fig. 8

Fig. 7—Completed lower impression.

Fig. 8—Cast of upper — darkened spots indicating where this ridge must be "faked" before base is adapted.

with humps and hollows until the whole looks a great deal like a child's sand-table study of physical geography.

At this juncture the reader will concur readily in the writer's observation that the dentist has a splendid opportunity through the use of these bases to conform the tissues to the crest of the ridge and to form the blood clots in this matrix so as to round out this tissue to its physiological limit.

When the upper impression is thus finished as described, it is poured with plaster of Paris; and while hardening the lower is taken. The technic in the case of the lower is practically the same, except that the writer has found it wise to take the lingual or inner borders first, since this portion of the impression afterwards acts as a guide to the proper seating of the impression while securing buccal and labial adaptation. *Fig. 7* shows impression of lower. This is now poured with plaster, and while in the process of setting, the upper is removed from the impression by first removing the overhanging margins of the compound from the tray by breaking or splintering the compound with a wooden mallet such as is used in placing cohesive gold fillings. If the tray has been treated kindly since it left the supply house it may be removed from the compound with no difficulty. The writer knows of no instance in which an impression tray that has received proper care need ever be placed in even lukewarm water. The cast is now inverted and rotated in the hand over a bunsen flame and the compound removed. *Fig. 8* shows the resultant cast. The crest of the ridges where the compound failed to unite or where the impressions of the tooth sockets were cut out has been darkened with ink in this figure in order to distinguish these more clearly.

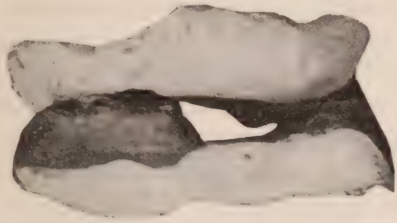

Fig. 9—Temporary bases completed.

This portion of the cast and any other irregularities which in the dentist's opinion should be corrected are filled in or smoothed out as seems best. Upon this corrected cast is constructed a base plate composed of Graft's Base Plate Material. The writer has yet to find any other material that even approaches Dr. Graft's material for the construction of temporary bases. In some other materials, when the texture is good the color is unsatisfactory; when the color is acceptable the danger of breakage is so great as to warrant rejection. Another particularly fine feature of this material is that it does not possess a "rubbery" or leather-like texture; in other words, Graft's material "stays put." After the technic is once acquired, the material also is easily adapted. The acquiring of a technic is necessary, because most dentists, at first, endeavor to adapt a whole sheet of the material at one time.

A satisfactory technic is to warm a sheet over the flame, holding it in the fingers and exposing first one side and then the other to the flame until by its own weight it begins to lengthen. It is now laid upon the cast and the palatal portion pressed lightly against the cast. As the material cools, heavier pressure with a more continuous application may be made. The sheet is now removed and the portion previously held between the fingers is warmed and returned to the cast and treated in similar fashion until adapted to place. Portions illy adapted or which remain rough or irregular during the process of adapting are warmed by the flame directed against them with the chip blower; this should receive particular attention in the peripheral margins where the excess of material is turned over on to the buccal portion until it appears too short. It is then re-adapted, using the blunt end of a spatula since the material will be too hot to adapt with the fingers. This procedure is continued along the entire periphery of the cast including the portion across the palatal region where often an additional piece an eighth of an inch in width is over-laid in order to give added strength.

When the base is removed from the cast, it will be found to be finished, excepting a few minor touches. It is sometimes necessary to use a sharp knife to scrape away any sharp edges remaining. The base is now taken into the operating room, rinsed off in cold water and placed in the patient's mouth. It immediately will evoke an expression of gratitude from the patient.

The lower is adapted in the same manner with the addition of a strengthener made from a piece of soft iron wire about 12-gauge. This wire is first contoured to meet the requirements of the case and afterwards flattened on the anvil before placing in position.

This is held in the center with a pair of pliers and heated uniformly, then placed upon the Graft's material already conformed to the lower cast, and pressed until imbedded. It may be necessary to use a cloth or the edge of a laboratory apron to keep from burning one's fingers while pressing this strengthener into position. In the region of the molars and bicuspids on both sides, modeling compound is conformed after the manner followed in building up bases to be used in taking the bite. Care should be taken to seal down the edges well and to smooth down the compound carefully, because these bases often are worn for a much longer period than the dentist intends that they should be worn.

This lower base with the modeling compound additions is now carried into the mouth; the occlusion with the upper base is noted and the compound trimmed away to meet the requirements of the normal relation of the jaws, which in this instance is determined very largely by the position of the lips. The lower base is now removed and the occlusal surface of the compound re-warmed by projecting a small flame against the surface when it is again returned to the mouth. The patient will close on it correctly—correctly, due to the fact that there is nothing in front upon which the patient can "bite," and also to the fact that the jaws are tired since they have been without any rest or support since the teeth were surgically removed nearly an hour before.

The degree to which the jaws will close will depend upon the degree to which the compound has been warmed, and this is usually too much. Accordingly, care should be taken that the surface only is warmed, just enough to get an imprint of the upper base.

The lower is removed and chilled and the compound smoothed and narrowed up bucco-lingually so as not to interfere with the lateral movements of the mandible.

Fig. 9 shows the bases completed ready to be placed in the mouth and worn until the tissues are ready for temporary dentures. In most instances, when these bases are inserted in the afternoon, say about four o'clock, it is found that about ten o'clock the next morning the tissues already present a united appearance. While wearing these bases the patient should remove and wash them several times daily, using for this purpose cold water and a stiff vegetable brush.

A question often propounded is: "How soon after the teeth are removed may temporary dentures be constructed?" In every instance the answer is "immediately." However, "immediately" varies in meaning according to the condition of the mucosa, which in some instances will bear the stress of impression-taking before the effects of the anesthetic are dissipated; in other cases there will be an interval of twelve, twenty-four, or thirty-six hours and sometimes even as much as seventy-two hours.

While several advantages are secured through the construction of the temporary bases discussed in this article, namely, the bandaging of the wounds in addition to taking the place of the stitches usually employed by the surgeon, checking the hemorrhage, providing the patient with a rest or support for his jaw, making it possible for him to eat something when the next mealtime comes, affording him relief from the unnatural feeling which accompanies the loss of his teeth and giving him a satisfaction which will promote an assurance of the satisfaction to be derived from properly-constructed artificial dentures, the one advantage far surpassing any of these just mentioned and an advantage too that wholly justifies the construction of these bases as splints is the fact, that immediately after the patient's teeth are removed he begins to grow accustomed to the wearing of bases.

Shukert Bldg.

FRICTIONAL RETENTION IN REMOVABLE BRIDGEWORK*

BY GEORGE L. ROTH, MEMPHIS, TENNESSEE

AT THE VERY OUTSET of a discussion of any phase of Partial Removable Restoration we are confronted with the question of terminology. Unfortunately such is the condition of dental nomenclature in general and particularly of the topic upon which I have the honor of addressing you, that it is absolutely necessary, if we are to avoid misunderstanding, to preface one's argument with definition of some of the major terms it is proposed to use.

Take, for example, the term "removable bridge." A removable bridge is an artificial denture, removable at will by the patient, depending wholly for support and retention upon attachments to natural teeth. There should be no difficulty about this whatsoever. Yet, we constantly hear appliances so designated that can not be termed "removable bridges" without making the term "bridge" a meaningless one. A denture which depends, in any way, upon the alveolar ridge for support is not a bridge. An upper denture replacing bicuspids and molars, and retained by attachments to cuspid teeth is not a bridge. A lingual bar lower, unless there are posterior supporting molars, is not and can not be a bridge. Appliances, such as these, are most important; they deserve our most serious consideration, but why pervert our language and confuse our thoughts by a slipshod use of common terms?

Dentures which depend in any way upon the alveolar ridge for support, I would divide into two classes, partial plates and saddle and attachment dentures. I would distinguish between these two classes by reference to the extent to which the alveolar ridge is employed to resist masticatory stresses. In other words, if a segment of the alveolar ridge is utilized measuring more than one-third of the whole arch, the appliance is a partial plate; if it is not greater than one-third of the whole arch, I would suggest terming it a saddle and attachment denture. Partial plates, saddle and attachment dentures and removable bridges constitute the whole field of partial removable restoration, and partial removable restoration is one of the widest and the most fascinating branches of prosthetic art. As the time at our disposal, however, does not permit us to explore but one corner of this great field, we will deal only with removable bridgework, with dentures, to repeat, which depend for support and retention wholly upon attachments to natural teeth; and we will furthermore restrict ourselves to the problem of retention.

It may be stated without fear of contradiction that the mechanical problem of retaining a removable bridge in the position required for functional efficiency, without injury to the teeth, is a problem that positively has been solved. It has been solved, in the main, by the application of the principle of friction, by our knowledge of the homely fact that the tendency of a body to move can be arrested if sustained pressure is brought to bear, at right angles to the path of displacement, upon the

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*Read before the Tennessee State Dental Society, September 1919.

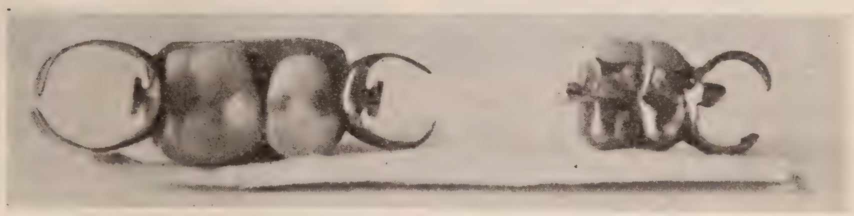

Fig. 1 Fig. 2

Fig. 1. Posterior replacement retained by lock clasps, set in crowns.

Fig. 2. Posterior replacement retained by lock clasp and Yirikian attachment, set in inlays.

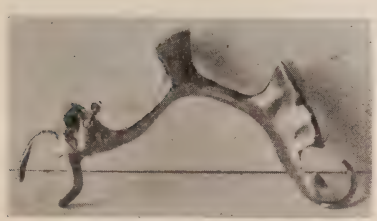

Fig. 3

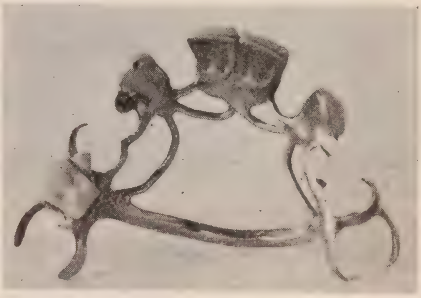

Fig. 4

Fig. 3. Removable bridge retained by bicuspid and molar lock clasps and Yirikian attachment, set in inlays.

Fig. 4. Removable bridge retained by cast clasps. No invasion of natural crowns.

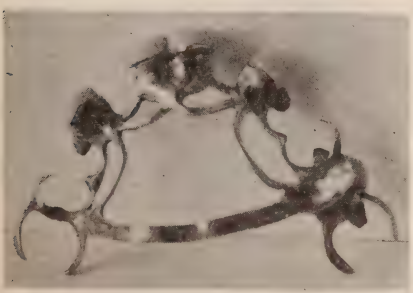

Fig. 5—Same as Fig. 4.

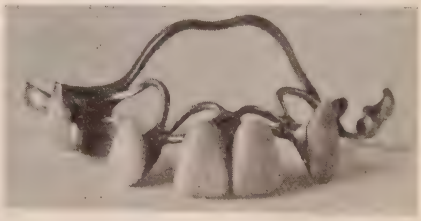

Fig. 6—Same as Fig. 5.

mobile body, or by one of its surfaces upon the surface of another fixed body. Take the clasp, for example, the primitive type of frictional attachment in removable bridgework. Between the enamel walls of the tooth grasped by it and the inner surfaces of the arms of the clasp there is friction. That friction is caused by the sustained pressure of the free arms of the clasp and that pressure, in turn, is induced by the tensile qualities of the metal composing it. It is true of course that friction is not the force resisting lateral displacements, the effect of horizontal movements of the mandible. Those displacements are prevented through the mere apposition of the clasps to the teeth, by the stability of the clasps themselves and of the roots of the teeth in their sockets. It is the vertical displacements, the tendency to drop or to move up or down out of place in response to the movements of the muscular tissues of the mouth, or the pull of sticky substances in mastication: these are the displacements that are arrested by the grasp of the clasp. The retention efficiency of the clasp may be augmented by the irregularities and contours of the dental enamel, but it is friction, friction due to the sustained pressure upon the tooth by the free arms of the clasp, upon which we depend for retention.

Let us develop this theme with the clasp as our illustration. Grant that the usefulness of the clasp is based upon friction, it follows that that usefulness will depend upon the amount of friction that can be generated between the clasp and the teeth. The amount of friction depends upon two factors, (1) the "tightness" of the clasp, that is the amount of pressure exerted by the arms of the clasp upon the tooth, and (2) the extent of the area upon which that pressure is exerted. A gigantic clasp grasping a cylinder ten feet long and two feet in diameter, with a given degree of pressure upon a given unit of area, would be much more difficult to remove than a clasp grasping with the same degree of constant pressure a cylinder twenty millimeters long and four millimeters in diameter. In other words, if you increase the area covered by the clasp, the areas upon which the pressure is directly active, you increase the amount of friction obtainable with a given degree of pressure. Or to put it conversely, the narrower and smaller the clasp, the tighter you have to bend it upon the tooth to make it hold.

Keeping in mind these rather obvious truths, we can formulate the fundamental law for all frictional attachments. With a given degree of pressure, the retention efficiency of the frictional attachment varies with the total extent of the effective frictional area; that is to say, with the extent of those areas upon which the pressure may be directly increased by augmenting the tension of the attachment.

It is evident at once why a flat clasp, when it can be used, is more efficient than a wire clasp, and a cast clasp than any other type of clasp known to us, at any rate since Mr. Weinstein has provided us with his wonderful alloy, the Neyoro casting gold, formula E, which possesses

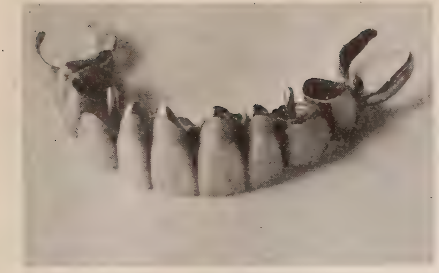

Fig. 7

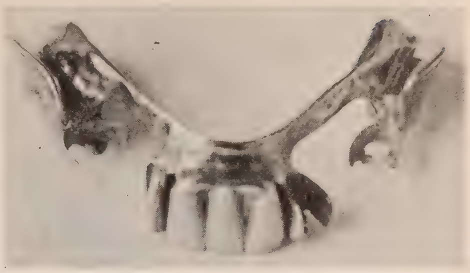

Fig. 8

Fig. 7. Removable bridge, with molar lock clasps, bicuspid telescope crowns, removable cuspid crowns with split pin attachments.

Fig. 8. Saddle and attachment denture retained by cast clasps.

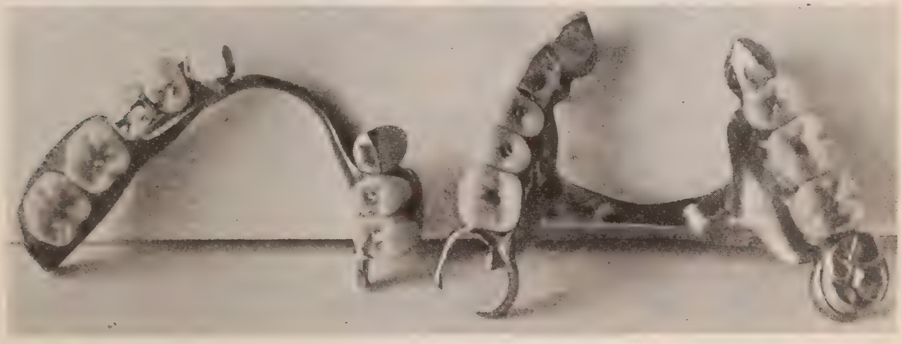

Fig. 9

Fig. 10

Fig. 9. Saddle and attachment denture, bicuspids, removable crowns with spilt upright attachments, cuspid, cast clasp. Split bar set in molar crown. Saddle joined in compression relationship.

Fig. 10. Removable bridge. Cuspids removable crowns with split pin attachments, left molar cast clasp, right molar crowned with cylindrical gold cap, cast clasp with occlusal restoration.

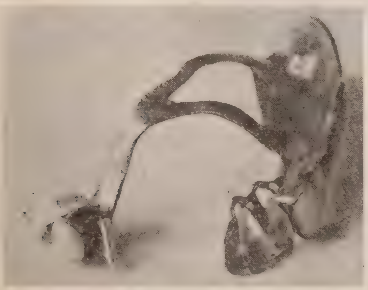

Fig. 11

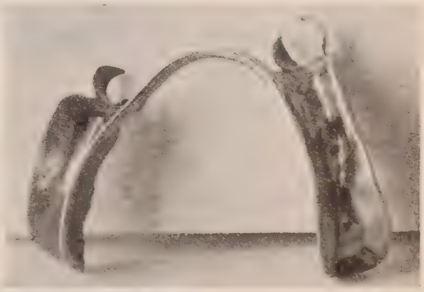

Fig. 12

Fig. 11. Partial plate retained by split pins in double discs, on central and lateral, bicuspid Yirikian attachment, molar lock clasp. Saddle joined in compression relationship.

Fig. 12. Saddle and attachment denture retained by cast clasps.

the invaluable property of retaining a high degree of tensile strength and resiliancy even when cast.

The wire clasp is the least efficient type of clasp because its effective frictional area is only a line. It is really less, for the simple reason that only in theory does it permit an actual line contact. In practice, even the most carefully-fitted wire clasp, under the magnifying glass, can be seen to touch only at a few points. A wire loop-clasp is more effective, but the old fashioned flat clasp is superior to either of them. Yet even a flat plier-fitted clasp, carefully made and used under the most favorable circumstances is immeasurably inferior to the cast clasp. If you trim it very carefully, so as to keep it away from the under-cuts of pronounced contours, if you spend enough time fitting it with proper pliers to a good metal die, you may be lucky enough to obtain contact at twenty or even thirty points, but not more. On the other hand, if the clasp is cast and fitted properly, while it may be an exaggeration to say that it literally touches at every point of its inner surface, it is a fact that there is contact at so many points that they could not possibly be counted. In fact, to state the case of the cast clasp in terms of our law, *where it is indicated*, the cast clasp yields a greater effective frictional area than any other type of clasp.

To determine when clasps are indicated, on the mechanical grounds of retention efficiency, is not a difficult matter, if we keep in mind our fundamental law of frictional retention and the factors involved in that law. To begin with, clasps are not indicated as primary attachments upon anterior teeth. No effective frictional area can be established upon the labial and lingual surfaces of anterior teeth for the simple reason that these walls slope away. They form a cone, and you can not grip a cone with hard polished surfaces by means of something that is as hard and smooth as the inner surfaces of a clasp. The mesiodistal grip clasp is sometimes helpful, as a secondary attachment, an auxiliary in retention as it were, but they are useless as primary attachments. The reason is obvious. The effective frictional area of the mesiodistal grip clasp is too limited for it to be depended upon unless there are effective primary attachments elsewhere.

Clasps are indicated as primary attachments only upon posterior teeth and even then conditions are not favorable in a very large number of cases. Short bicuspids and molars with sloping sides tending to a conical form are eliminated. Posterior teeth which incline, or which present pronounced enamel countors also must be eliminated, if we hope to obtain a serviceable degree of frictional retention. The frictional areas must be approximately parallel. If they are not even approximately parallel, then in taking the bridging out of the mouth, the clasps will soon be bent, the area of apposition reduced by the distortion of the clasps, and the effective frictional area lessened materially.

Now if nature and neglect, or both combined, have so malformed the natural denture of the patient that the surfaces of the teeth do not present approximately parallel areas of sufficient extent to be used for frictional retention, we must either create such areas ourselves, or we must be content with a smaller degree of retentional efficiency for our removable bridgework. In other words, the natural teeth must be invaded and with artificial crowns or with inlays paralleled frictional areas must be made. A few years ago this could be said without hesitation, and without fear of serious objection. Today, however, there exists in the minds of many dental surgeons a strong and a sincere objection to what they term the "mutilation" of sound tooth structure for the sake of artificial restoration. This question, of course, lies outside of my province. It would be an impertinence for me, as a dental technician, to even take sides in the controversy. Before concluding my remarks, I propose to state the issue, but that is all. I would not presume to argue it.

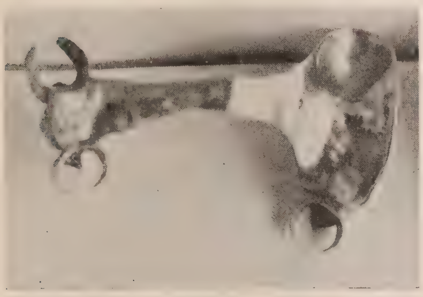

Fig. 13

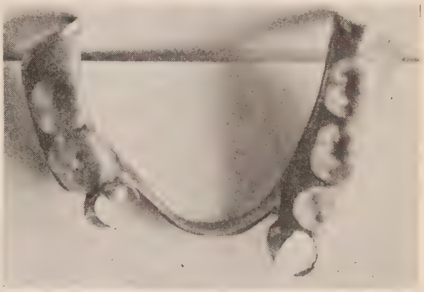

Fig. 14

Fig. 13. Saddle and attachment denture retained by cast clasps.
Fig. 14. Same as Fig. 12.

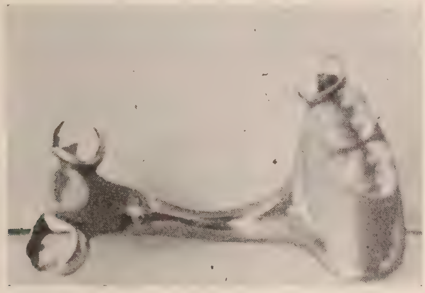

Fig. 15. Same as Fig. 13.

For the present, however, let us assume for the sake of argument, that the invasion of tooth structure is permissible, and consider how we can thereby create adequate frictional areas.

An early, and a very obvious method of correcting these deficiencies in natural teeth, the crowns of which were either conical or too contoured to give most effect to clasps, was to crown them, and to contsruct the crown so that the desired results could be obtained. It is true that the chief reason why teeth were crowned for the reception of clasps, at the time of which I am speaking, was the belief that clasps were injurious. Still frictional efficiency was also a consideration, even if not recognized by those exact words. It was soon found that this method did not improve matters very much with very short teeth, or with teeth the areas of which were inclined in opposite directions. Ingenuity threw itself into the breach, however, and it was seen that when the artificial crowns themselves could be constructed so as to provide adequate parallel surfaces, fittings could be joined to the crowns, the surfaces of which, artificially paralleled could be made to assist in the task of retention. The Bennett blade and the split tube are good illustrations of the modes of retention evolved at this stage of thought.

The Bennett blade consists of a heavy bar or blade of metal soldered between two crowns or two abutment inlays, grasped by two heavy but springy plates of metal set in the body of the bridge. The primitive split tube attachments consisted of straight pieces of fourteen gauge wire joined perpendicularly to the abutment crowns and paralleled with each other. They are grasped by heavy tubes slit on the side next the crown, which slide on and off the bars of wire and which can be tightened upon these bars in the same way that a clasp is tightened around the natural crown of a tooth. To this group of attachment also belongs the earlier Roach attachment, in which a ball is substituted for the round bar with the split-tube device.

It was not long, in the early days of attachment work, before another improvement was invented. It was seen that there was more than one way in which to obtain the sustained pressure necessary to establish friction. With the clasp, the split tube, the old Bennett blade, and certain of the roach attachments, this was a converging pressure. It was obtained by bending the blades of the wings of one part of the attachment upon the other. But it was soon realized that this pressure could be obtained in the opposite way, namely, by the expansion of the two halves of one part of the attachment within and against the walls of the other part. This idea was utilized in another ofthe Roach attachments. The ball was split into two halves, these in turn could be spread apart so as to tighten the attachment, to increase the pressure and therefore the friction. It also is utilized in the Peeso split pin, the two halves of which can be spread apart so as to increase the pressure and therefore the friction between the pin and the tube set in the root of the abutment tooth. The old Morgan attachment also worked upon this principle of expansion, and the idea of blades, or bars split and capable of being spread or expanded in a box or slot, is utilized in nearly all of the strictly modern, removable bridge attachments. It is to be seen in the split bar, the upright, the Yirikian attachment and the devices developed by Dr. Hermann Chayes.

The appearance of the modern removable bridge attachment was settled the moment that it was understood that the pressure upon which friction is based may be an expanding as well as a converging pressure. It does not matter how this pressure is obtained so long as it is at right angles to the path of displacement of the denture. This led up to the next step. If you can get your pressure by expansion within a box, a tube, a slot or a sleeve, why not set that box, tube, slot or sleeve right within the circumference of the artificial crown set upon the tooth? With all the older attachments the device was set outside of the crown, and often at some distance from the axis of the tooth. The consequence was that under the lateral stresses of mastication an injurious leverage was brought to bear upon the natural abutment. In the technical jargon of this work the older attachments were "outside" attachments, whereas all the accepted modern devices are "inside" attachments, emplaced within the limits of the original circumference of the natural crown, as near to the axis as possible, without endangering the pulp; this leverage from lateral stresses has been so reduced that it is no greater than the leverage exerted upon the abutments of a fixed bridge. The proof of this is to be seen in the fact that none of the earlier attachments can be used in connection with inlays, for the simple reason that no inlay without a pin or post going down into the canal of a devitalized tooth could possibly stand the leverage they involve. It is one of the signal advantages of our modern removable attachments that it is not necessary to inflict upon the patient the unnecessary mutilation involved in crowning a tooth. Above all, the objection that removable bridgework requires the devitalization of tooth has been finally overcome.

Now that the simple conditions of frictional retention are properly understood, we have advanced beyond the silly age of patented attachments, the age in which this work was surrounded with mystery. The retention of removable bridge work is a simple problem, it requires no more than the requisite appliances, plenty of patience, the firm grasp of a few basic mechanical principles and a certain degree of technical skill. A prominent dentist said recently that the practice of removable bridgework required an element of genius, a degree of manipulative dexterity absolutely beyond the ordinary man. It was a very well-known man who said this, but, nevertheless, he said an exceedingly ridiculous thing.

I will not take up your time now by describing the minute differences between the various types of modern removable bridge attachments, which are today standing the tests of actual service. At the conclusion of these remarks, I will exhibit upon the screen a few slides which will illustrate what has been said.

Last of all let us touch upon the great issue, the question whether the emplacement of crowns or inlays for the sake of retaining a denture is permissible dental practice. As I said before it is not within my province to take sides in an issue of dental surgery. I am not competent to do so. But, I do feel competent, on the basis of my dealings with a great many dentists, to enunciate the thing that is really at stake. The issue is not the restoration of teeth. It is the restoration of function. What is an artificial denture? An artificial denture is an appliance designed to restore those functions directly impaired by the loss of natural teeth. Its perfection, its naturalness lies solely in the effectiveness with which it does this. Effective retention is vitally important. Therefore, when you are deciding this issue, when you have, so to speak, placed on one side of the scale the pristine physical perfection of a natural tooth, remember that in the other scale, if you are fair, you must place nothing less than the restoration of function. You must view the masticatory apparatus as an organic whole.

This brings me to what we may term the paradox of "removable bridgework." A removable bridge must be removable at will by the patient. It must be removable with ease. It if can not be removed with ease, then there is a danger of losing those advantages upon which the prophylactician has a right to insist. The patient must easily acquire the habit of removing the denture without discomfort, without effort, without injury to the appliance or to the natural abutments, so that the surfaces of the abutment teeth may be kept clean as well as the bridge itself. On the other hand, the bridge must be so well retained as to be displaced with the greatest difficulty. There lies the paradox. The solution is to be found in frictional retention properly understood. The attachments must be designed so that the bridge can easily be removed in one direction only, and that the maximum of friction can be obtained with the minimum degree of tightness, of pressure or tension. This result can only be obtained by the use of carefully-designed, accurately-paralleled attachments.

THE RESTORATION OF THE LABIAL AND BUCCAL VESTIBULE OF THE MOUTH WITH EPITHELIAL INLAYS USING BLOCK ANESTHESIA*

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THE USE OF BLOCK ANESTHESIA has proven to be far superior to a general anesthetic for the placing of epithelial inlays in the oral cavity.

First, to obtain a cleaner field for operation.

Second, to have the cooperation of the patient.

Two mandibular injections are made for the inlays to be placed in the lower jaw. The inlays are more successful even in the anterior portion of the lower jaw where the mandibular injections are used instead of the mental injections. This, I think, is due to the solution being far distant from the point of operation.

The infraorbital injections are made for the inlays placed in the anterior portion of the upper jaw for the freeing of the upper lip where injury has caused contraction of the tissues and the adhering of the soft tissues to the muco-periosteum, or where ulcerated conditions in the mouth had caused a closing of the vestibule by the two raw surfaces becoming attached.

A two per cent. solution of novocain containing the right proportion of suprarenin and the Ringer solution is used for the injections.

Most of the operations experienced by the author were performed in the Queen's Hospital in the Australian section, at Sidcup, England, by Drs. H. S. Newland and K. Russell.

Up until the summer of 1918, general anesthetics had been employed for this work. We decided then to give block anesthesia trial for this work and it proved better than the general anesthetic.

Grafts of thin shavings from the epidermis of the arm are used to cover the raw surface where the mucous membrane is missing. These are known as Thiersch grafts. Skin transplanted into the mouth is a practicable substitute for mucous membrane.

The operation: The case in mind that I will describe was of Private ——— that had a comminuted fracture of the lower jaw with bad laceration of the soft tissue under the lower lip. The teeth were lost from the left first bicuspid to the right second bicuspid, because their roots extended through the lines of fracture.

A cast silver splint was applied for the maintenance of the correct position of the fragments. This splint remained for about five weeks. (*Fig. 2.*)

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*Presentation before the Tennessee State Dental Society, Sept. 1919.

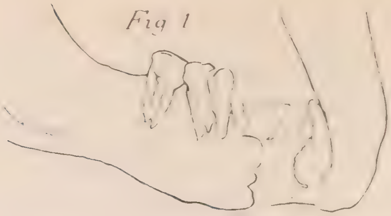

Fig 1

After the fracture had healed the lower lip and had closely adhered to the muco-periosteum and it was necessary to free the lower lip by making an incision and placing an epithelial inlay between the raw surfaces to prevent the reattachment of the raw surfaces.

A cast silver splint was then constructed for the maintenance of the plate of cast silver that was to approximate the raw surface afte rthe incision had been made, *Figs. 3, 4, 5.*

A two per cent. solution novocain had previously been infiltrated in the form of a circle, the field having been prepared by washing with soap and water and followed with alcohol for the taking of the graft. The graft was taken from the skin of the arm coving the biceps muscle which contains no hair.

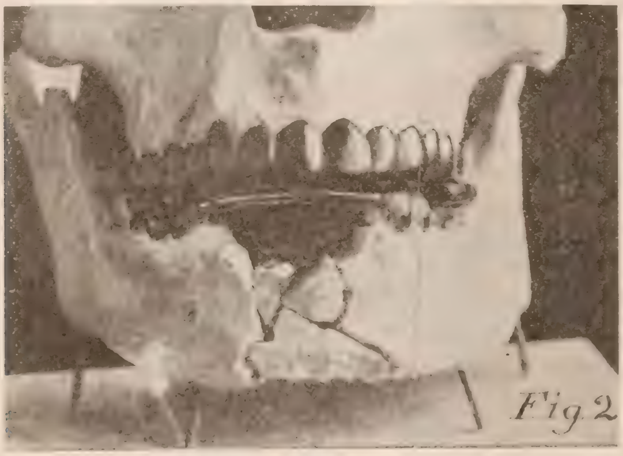

Fig 2

The graft was cut with a razor by having the assistant hold a thin board edgewise against the arm, and then the operator placing another board in a like manner and pulling downward so as to stretch the skin.

After the graft was cut it was wrapped around the modeling compound and placed in the mouth where the incision had been made with the raw surface of the graft outward, *Fig. 6.*

This was kept in the mouth for about three days, when the modeling compound-covered plate was removed leaving the graft in place. The modeling compound was replaced with hard vulcanite rubber and put

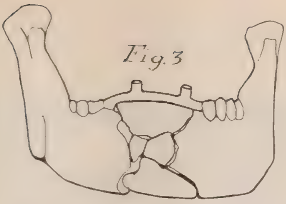

Fig. 3

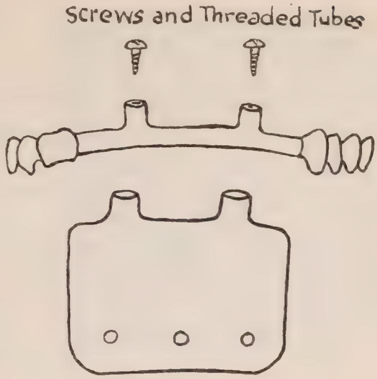

Fig 4

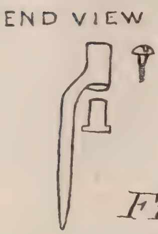

Fig. 5

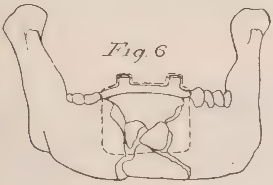

Fig. 6

back in the mouth to remain there for a day at a time when it was removed and irrigated with saline solution.

After healing had taken place a permanent denture was placed in the mouth.

JOBS

A small man can make a big job shrink to littleness but it takes a big man to make a little job grow into a big one.

RECONSTRUCTION WORK IN WAR INJURIES OF THE FACE AND JAWS*

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AS HAS BEEN POINTED OUT MANY TIMES BEFORE, the successful treatment of maxillofacial injuries depends on teamwork between the surgeon, the dental surgeon and the dental prosthetist. We desire to outline the practical application of this cooperation at the Walter Reed General Hospital.

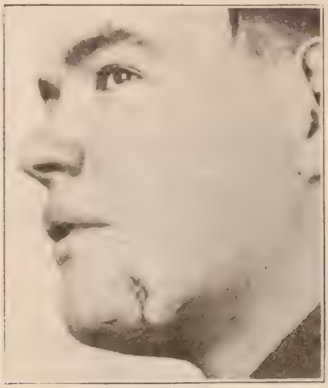

Fig. 1

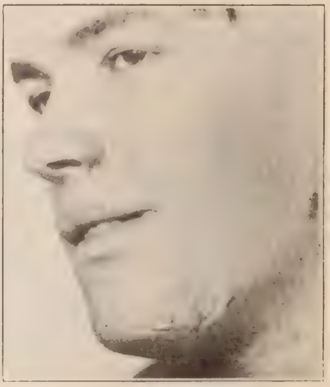

Fig. 2

Fig. 1 (Case 1).—Wound received, Sept. 26, 1918. Depressed scar, left side of chin and angle of mouth.

Fig. 2 (Case 1).—Appearance of patient, May 10, 1919; plastic operations performed April 2 and April 11, 1919.

The patients arriving from overseas belong, in general, to the following groups:

1. Compound comminuted fracture of the mandible in process of consolidation. These may or may not have been splinted before arrival, and require observation until union is complete.

2. Compound comminuted fracture with delay in union and healing of the soft parts due to the presence of sequestrums, infected teeth in

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*Read June, 1919, before the Section on Stomatology, A.M.A., of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement.

*From the Walter Reed General Hospital.

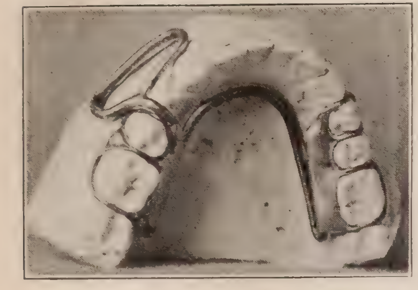

Fig. 3

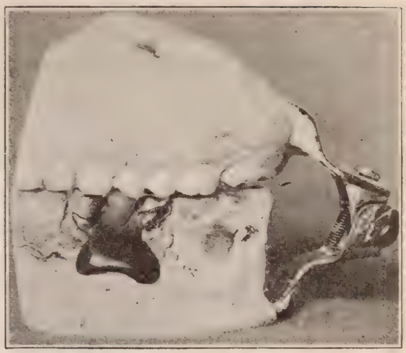

Fig. 4

Fig. 3 (Case 1).—Temporary appliance attached to lower teeth to hold mass of modeling compound covered with epidermic graft to restore buccal sulcus.

Fig. 4 (Case 1).—Permanent denture with vulcanite pad passing down into restored sulcus.

or near the line of fracture, foreign bodies, etc. These require incision and drainage, removal of sequestrums, teeth, foreign bodies, etc., and general treatment of sepsis, in addition to splinting.

3. Ununited fracture with loss of substance. In many of these cases the tissues have been healed for some time, and there is evidence that union is not going to take place spontaneously. These require bone grafting. In others, when the nonunion is due to infection or lack of

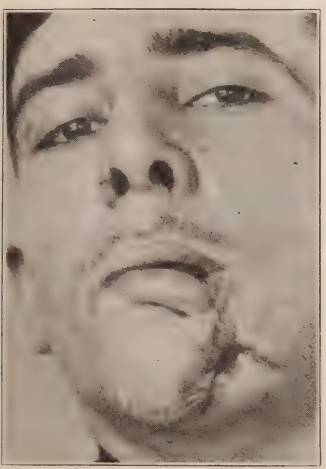

Fig. 5

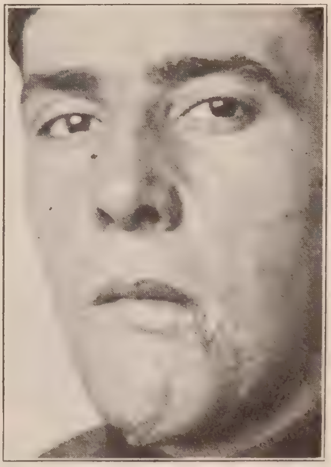

Fig. 6

Fig. 5 (Case 2).—Gunshot wound received, Sept. 29, 1918. Keloid scar of chin.

Fig. 6 (Case 2).—Appearance of patient after plastic operation, performed April 9, 1919. Scar tissue excised, and raw surface covered with pedicle flap from neck.

fixation, the application of splints and removal of all sources of infection will often result in new bone formation and eventual solid union.

4. Healed scars involving the soft tissues alone, requiring plastic operation, excision of scar tissue and obliteration of the deformity by flap sliding, fat transplantation, etc.

5. Fractures associated with more or less extensive destruction or laceration of the soft tissues of the cheek, lips and chin. These, of course, require fixation of the fracture and correction of the soft tissue deformity (*Figs. 5 and 6*). Frequently the upper and lower buccal and labial sulci are partically obliterated by adhesions of the mucous membrane to the bone. These are best treated by division of the bands of scar tissue and the covering of the raw surfaces with epidermic grafts placed on modeling compound inlays attached to prosthetic appliances. Many of these injuries are accompanied by trismus, which requires treatment by jaw stretching and other measures.

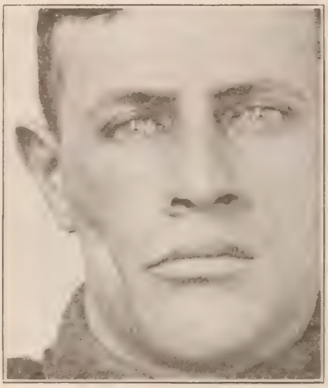

Fig. 7

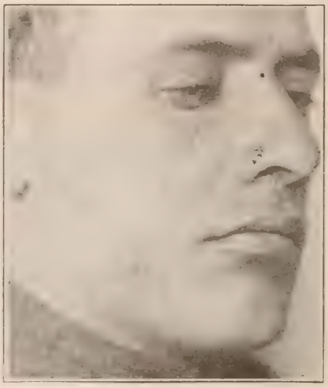

Fig. 8

Fig. 7 (Case 3).—Wound received, Oct. 4, 1918. Depressed scar, right cheek.

Fig. 8 (Case 3).—Appearance of patient after operation, performed April 11, 1919. Scar tissue, excised, edges of wound undermined, and free abdominal fat transplanted to fill in defect.

6. Cases presenting perforation of the hard palate or having openings between the buccal cavity and the maxillary sinus, requiring operative or prosthetic closure.

7. Miscellaneous cases of injury of the nose, orbit, external ear, etc., requiring plastic operation.

In every case a thorough survey of the mouth is made, clinically and roentgenographically, to eliminate any factors that may be keeping up infection. All teeth in or near the fracture lines are extracted, bone cavities drained, and sequestrums and foreign bodies removed. The splints employed in fixation of fractures are as simple as the nature of the case will permit. For many of the uncomplicated cases with many teeth and good occlusion, in which maintenance of reduction is easy, intermaxilary wiring of the teeth has proved efficient. For the majority of cases we employ the cast silver cap splint. When there are firm teeth on both sides of the fracture it may be necessary to splint only the lower jaw, thus permitting mastication. For other cases the upper and lower teeth are splinted separately, the two splints being locked together in occlusion with a removable bolt on each side. While we can conceive of the advantage of early application of open-bite splints in certain cases coming to us late with trismus, we have rarely seen a case in which the late application of the open-bite splint would have any particular advantage over the closed-bite splint. Especially is this true in early and late cases in which the patient has no teeth in the posterior fragment and in which the use of the open-bite splint may result in union in malposition. For these fractures in or near the angle, particularly when ununited, preparatory to bone grafting, it is frequently necessary to prepare a saddle extension to cover the anterior surface of the ramus (*Fig. 14*). By means of a screw rod running from the upper splint to the saddle at an angle of 45 degrees to the line of the upper teeth, backward propulsion of the ramus may be brought about. In this backward propulsion, as the ramus rotates on the condyle, the change of position is accommodated for by a compensating hinge connection of the screw rod with the saddle. The saddle is made of vulcanite lined with a layer of velum rubber.

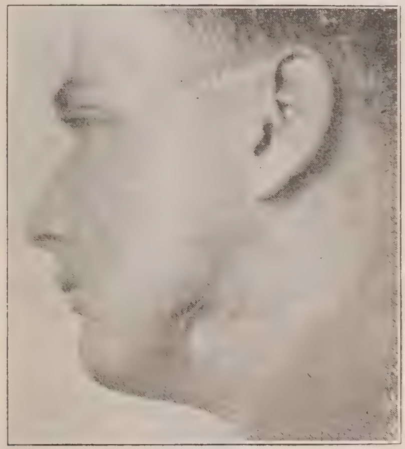

Fig. 9 (Case 4).—Wound received, Oct. 1, 1918. Ununited fracture, left body of mandible, 2 cm. loss of substance.

Various other mechanical appliances are invaluable as supports in plastic operations. Attachments are made to vulcanite plates and splints for holding modeling composition plumpers to bring out the lips to their

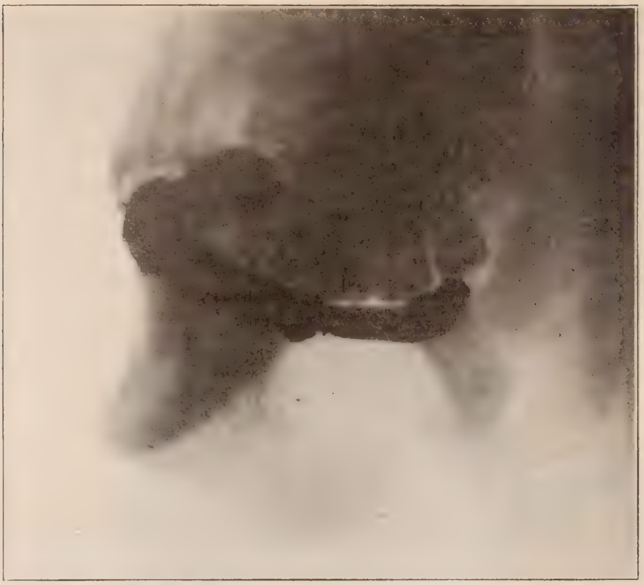

Fig. 10 (Case 4).— Loss of substance as result of wound.

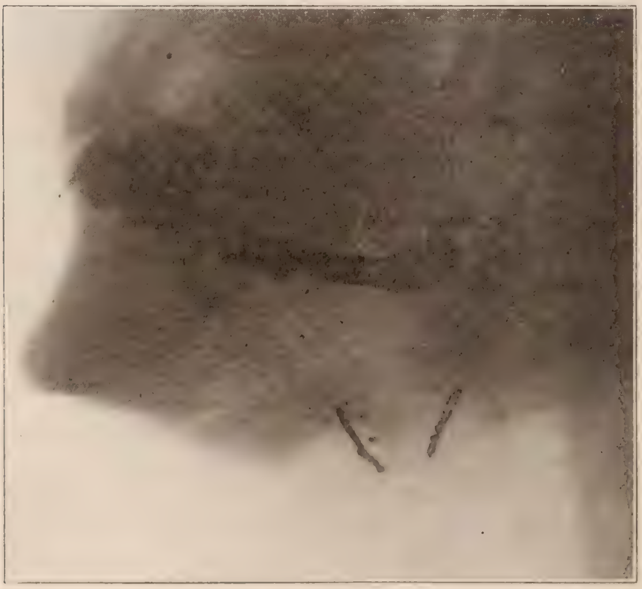

Fig. 11 (Case 4).—Pedicle bone graft, performed March 26, 1919. Examination, June 16, 1919, after removal of splint, shows perfect union.

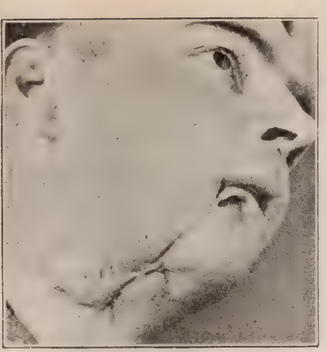

Fig. 12

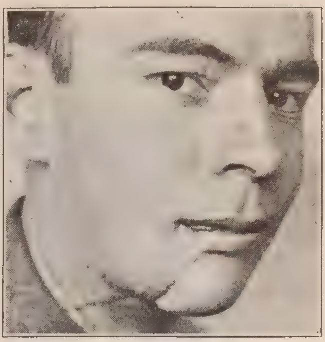

Fig. 13

Fig. 12 (Case 5).—Wound inflicted Sept. 26, 1918. Ununited fracture, right body of mandible, 3 cm. loss of substance. Appearance of patient before operation. Keloid scar of neck and chin.

Fig. 13 (Case 5).—Appearance of patient after plastic and osteoperiosteal graft operation, performed March 31, 1919.

normal contour and to form supports for epidermic grafts to replace mucous membrane on raw surfaces of the mouth (*Figs. 3 and 4*). External and internal nose conformers may be attached to the upper denture, as supports in nose plastics. Cheek supports held in this way are generally more satisfactory than those depending on the head band.

Two methods of bone grafting have been employed. In two cases of ununited fracture of the body of the mandible with loss of substance of not more than 3 cm., we have used the method of Cole, removing a piece of the lower border of the anterior fragment, with a pedicle of muscle and fascia attached to it below for nourishment, sliding it back to fill the gap, and attaching it to the ends of the fragments by means of

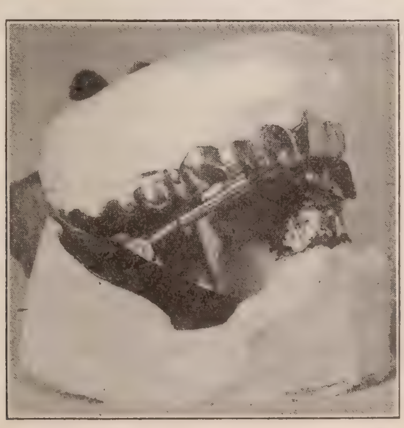

Fig. 14 (Case 5).—Cast metal cap splints used for fixation of ununited fracture during bone grafting. Extensible saddle for posterior fragment.

silver wire (*Figs. 9, 10 and 11*). Most of our cases have been unsuitable for Cole's method, either being too extensive, or situated at or behind the angle. In one case there was a defect of 10 cm. In the cases of the eight remaining patients operated on so far, we have employed the osteoperiosteal method of Delageniére. This consists of first exposing the ends of the fragments and preparing a pocket beneath and over each by stripping back the periosteum and soft tissue for a distance of about 1 cm. The graft is made by the removal of a thin shaving from the antero-internal surface of the tibia with a chisel, leaving the overlying periosteum attached. One piece of this is inserted in the pockets under the ends of the fragments and another over the fragments, with the bony surfaces of the grafts facing each other. It is necessary that the grafts be in contact with the previously freshened bone ends (*Figs. 12, 13, 14, 15, 16*). No fixation is used beyond suturing the deep tissues over the grafts, the jaws, of course, being splinted and locked in occlusion the day following the operation. It is early yet to report as to the final outcome in these cases. Primary union followed the operation in all cases except one, in which a hematoma occurred, followed by some suppuration and extrusion of small shreds of bone from the graft. Even in this case, guided by the experience of Delageniére himself, it is hoped that union will occur. In the earlier cases, there is good evidence that union is taking place. The splints will not be removed for at least two months and a half.

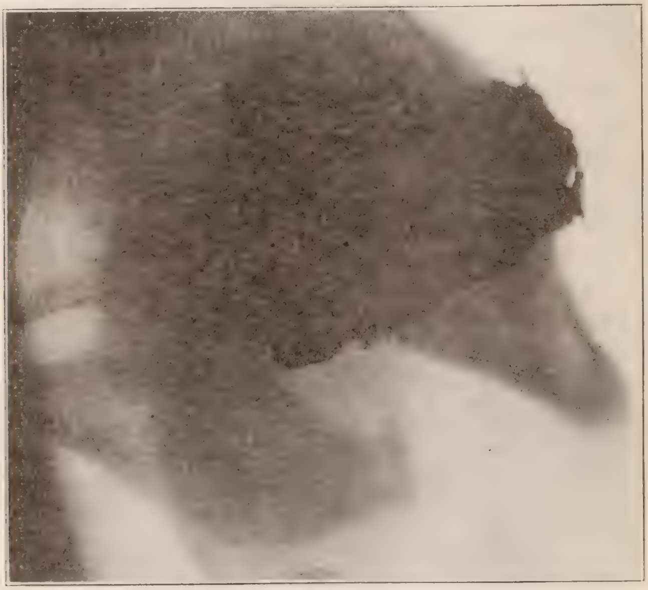

Fig. 15 (Case 5).—Loss of substance of mandible as result of wound.

Free abdominal subcutaneous fat has been employed several times

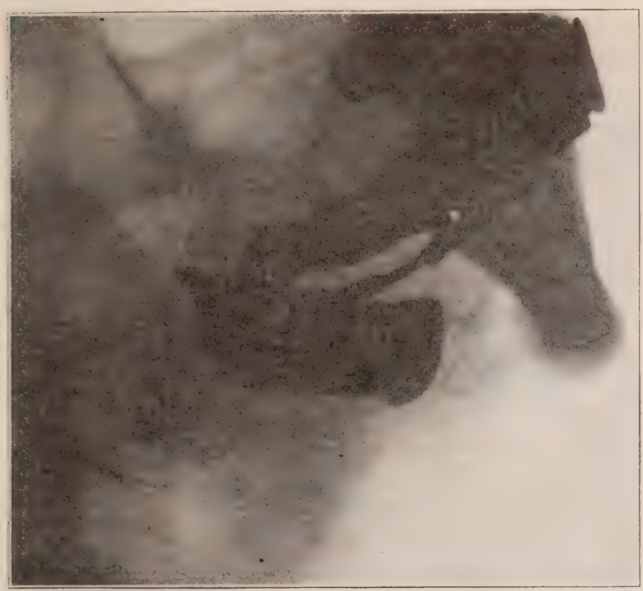

Fig. 16 (Case 5).—Osteoperiosteal graft in place, May 3, 1919.

to fill in marked depressions left by excision of adherent scars or when underlying bone has been lost (*Figs. 7 and 8*).

Costal cartilage transplants are used for correcting depressed nasal bridges. As a rule the entire thickness of the sixth cartilage is used.

The anesthetic most commonly employed is ether, given intrapharyngeally through nasal tubes. The bottle containing the ether is attached to an oxygen tank, and the bubbles of oxygen carry the ether to the patient, there being thus no necessity for a foot bellows or motor pump. Ordinarily it is not necessary to warm the ether. Regional and infiltration anesthesia with one per cent. procain-epinephrin is very useful for many of the lesser plastics.

Careful records of cases are being preserved by means of photographs, color sketches, diagrams of operations, roentgenographic prints, plaster casts and wax models.

A RESUME OF BLOCK ANESTHESIA*

BY E. A. LITCHFIELD, D.D.S., HUMBOLDT, NEBRASKA

IN DENTISTRY, as in other professions or lines of endeavor, various methods or systems of technic are presented, are tried out, and quite frequently found wanting. Occasionally some method, or system of technic, its own true worth its best endorsement, outlives the experimental state and becomes a fixture. Block Anesthesia, or Conductive Anesthesia is one of these. "More and more men appear to realize the great benefit—the advantages to themselves of nerve blocking anesthesia and more and more appreciate its wonderful advantages to their patients." (Futerback, *Dental Review*).

The writer believes that in the history of dental surgery, no method or technic has proven itself a greater blessing to the patient nor a more wonderful aid to dental surgery than has nerve blocking anesthesia.

In preparing this paper for your consideration I have endeavored to give prominence to those points which I have found to be of most interest to the practitioners of dentistry in general, as evidenced by their questions in classes. (It having been my privilege to act as assistant to Dr. Arthur E. Smith in the giving of instruction to some three hundred men, and I want to acknowledge my indebtedness to him for what I know of block anesthesia. He is most liberal with his information and with what he knows, and I have been able to get from him anything that I wanted. The technic I shall describe in the slides is the Smith technic absolutely. I am claiming nothing for that and most of the paper I have gotten from him).

Block anesthesia may be defined as that method of anesthesia in which the functioning of a nerve trunk is interrupted at some point between its origin or exit from the skull, and its terminal nerve endings. Block anesthesia when the nerve trunk is *Macro*scopic; infiltration anesthesia when the nerve endings are *Micro*scopic.

The person who presents for services upon his dental organs today, has every right to expect and to demand that that service be rendered practically without pain—and he who practices dentistry today and is not proficient in some method of practically painless dentistry is doing an injustice to his profession, to himself, and to the patients who intrust themselves to his care.

Of the various methods of accomplishing a painless operation upon the dental organs, or a minor oral surgery, there is no one which answers the purpose in so large a percentage of cases and in such a variety of operations as does nerve blocking anesthesia.

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*Read before the Nebraska State Dental Society, May, 1919.

"Almost anyone who has seriously entered the practice of conduction anesthesia has found that, with increasing experience in its use he employs it more and more to the exclusion of the commonly-practiced type of infiltration. This is accounted for by the comparative-painlessness of the insertion of the needle, and of the injection, the small amount of anesthetic solution required, the absence of afterpain and soreness, and the absolute anesthesia obtained. Patients upon whom it has been used for cavity preparation, or for surgical procedures, are pleased with the results, and request its use upon subsequent occasions, and that encourages one to use it more and more."(Puterback, *Review*).

"Of all the anesthesias of the jaws the mandibular is the most difficult, but the splendid results obtained, and the large area anesthetized, are ample inducements to the practitioner to acquire its technic."(Blum, *Cosmos*).

"In considering the advantages of local anesthesia we must not conclude that it entirely takes the place of general anesthesia, but it does fill a very large gap in Oral Surgery and Exodontia."—(Vaughn, *Cosmos*).

In these endorsements of block anesthesia the exponents of this method of anesthesia most heartily concur.

Block anesthesia finds its field of usefulness in dental and minor oral surgery and in operative dentistry; occasionally proving itself a valuable adjunct to the specialist in any particular branch of dental practice.

Block anesthesia is the method of choice:

1. In the removal of impacted teeth, where an amount of bone excision is necessary. The operator may proceed carefully but surely; a clean, non-mutilated wound results, in which healing is more rapid and afterpain is lessened. Ample time is assured in which not only to complete the operation but to dress the wound in whatever manner may be indicated as best, and however carefully that dressing must be done.

2. In exodontia for hypercementosed roots—roots that have been broken off below the alveolar border—removal of teeth with divergent and curved roots, where great care is necessary to prevent fracture and damage to the surrounding tissue, and again in the removal of all, or the larger part of the remaining teeth and roots in the preparation of the mouth for prosthetic procedure especially if alveolectomy be the operation.

3. In surgery for infected foci, granulomata, small cysts, fibrous growths, maxillary sinus operations, reduction of fractures, and root-end resection.

In the foregoing operations which are surgical in their nature, these points are of especial and vital importance; i. e. the patient is fully conscious and is able to cooperate entirely with the operator, and the swallowing of blood and mucous is precluded. The length of the anesthesia, as a rule, is of sufficient duration to minimize the afterpain.

In operative dentistry and in other branches of special endeavor in dentistry, the following may be briefly considered as fields of usefulness and indication for block anesthesia:

For cavity preparation, especially in those cases in which the patient's dread of dental pain makes the thorough preparation of the cavities otherwise impossible, for the patient who is willing to "stick it out" but who suffers agony and more or less shock in so doing; in all cases in which nervous strain, or fear of pain, precludes the successful preparation of the field of operation. In all preparatory work upon vital teeth which are to be used as abutments for crown and bridge-work, fixed or removable, it must be borne in mind, that in all operative preparation upon vital teeth strict attention must be paid to tooth anatomy. The pulp must under no circumstances be encroached upon unduly, nor in any case must the possibility of thermal shock and subsequent death of pulp be overlooked. To avoid this circumstance, operative procedure upon vital teeth under block anesthesia, must be performed with the tooth or teeth wet, that the pulp may be absolutely protected from thermal shock in the process of grinding or drilling.

In patients presenting with acute pulpitis, block anesthesia assures quick relief from pain, and enables the operator to proceed at once with such measures to assure no recurrence of that pain as his judgment may indicate for the case in hand. Nerve blocking is the method of choice in pulp removal, if that procedure be resorted to.

In all these operations the patient soon realizes that he will experience no pain—his relaxation may be actually seen and felt. Having secured the confidence of the patient, having noted his relaxation, the operator may give his entire energy to the operation at hand and the nervous strain upon the operator is reduced to the minimum.

In prosthetic dentistry the taking of impressions and bites, etc., for patients in whose mouths the least foreign substance causes gagging, nerve blocking removes the cause of the trouble and all necessary procedures may be carried out, free from further untoward influences.

The periodontist will find a niche for nerve blocking which will enable him to proceed not only more carefully and surely, but painlessly. At times the roentgenologist finds that in those patients in whose mouths it is almost, if not quite impossible to place a film for a roentgenogram, a light injection of the anesthetizing solution makes his pathway easy.

Considering now the patient himself, for whom an anesthetic is indicated or necessary, and for whom the choice must lie between a general anesthetic and block anesthesia, we find the latter method indicated and of decided advantage in those patients in whom exist heart and kidney lesions, in arterio-sclerosis, with high blood pressure, in goiter cases, etc.; and in patients who have but recently undergone an operation under a general anesthetic, and for whom immediate operation upon their dental organs is imperative, and for whom a repetition of the general anesthetic is not only contraindicated but dangerous. The latter class of cases is numerous today when foci of dental origin are not only the probable original cause of the operation, but when such foci preclude absolutely the patient's recovery until removed.

Having considered briefly the many advantages of block anesthesia and its indications in such a large number and variety of cases, it must be understood that local anesthesia, by any method, is advocated only as a further aid to a better and more scientific service to those who come under our care, and in no way to take the place of the general anesthetic when it is indicated. Further, too, it must not be inferred that block anesthesia has no disadvantages, or that it is accompanied by no untoward complications.

While the vast majority of nerve blocking injections are made with no untoward complications or sequelæ whatever, there are times, and one encounters patients when and for whom disagreeable and even serious conditions and complications arise.

Because these conditions are a possibility and because of the interest manifested in this phase of block anesthesia in classes of instruction, the patient himself will be considered briefly.

THE PATIENT

We are safe in assuming that practically no one presents for our services but who dreads our procedure. Particularly is this true if our procedure be of a surgical nature—the removal of teeth, etc.; if the patient be one in whom the fear of pain is a controlling factor, or if he be one who has been roughly handled, or badly hurt at some previous operation.

It is the writer's experience that no matter how calm and unconcerned the patient may appear to be, or really is for that matter, the patient's sympathetic system is on the alert and we begin our procedure as a rule, with the patient at high tension. This is evidenced by an increased pulse, the taking of deep breaths, the wetting of the lips, the rubbing of the hands, a feeling of nausea, and other outward signs of inward tension. It is the dentist's duty carefully to note these symptoms —any or all of them may be exhibited—that he may give his patient his best service with as little disturbance to that patient's nervous system as possible.

In no procedure which the dental surgeon is called upon to undertake, is psychotherapy, or "patient control" more demanded, nor is opportunity for exercise of this accomplishment more frequent than in preparing the patient for nerve blocking injections and the subsequent operations.

In the first place then, the patient should be allowed a period of complete rest after entering the office, should be gotten thoroughly warm, if chilled at all, and made as comfortable, physically, as possible, in order that he may regain his balance, so to speak, as nearly as his temperament will allow.

The operator should have absolute confidence in himself and in his method, and should devote his energy to making his patient feel that confidence.

The patient should be quietly but firmly informed as to the method of procedure—of the needle prick, which may be described as incidental; of the numbness, or tingling, or swollen feeling which he will experience in the parts anesthetized, but should be assured and reassured that all is well, and that, while he probably will feel the results of the operative procedure, he positively will have no pain. With some patients it may be well to allow them to see the boiling of the solution, and explain to them the steps of preparation and the reason therefor, while with others it will be best to allow them to see nothing, not even the syringe as it is introduced into the mouth. Each patient is a law unto himself, and the choice of methods of procedure is entirely a matter of the best judgment of the operator for the patient in hand.

For the vast majority of patients, the preparation just mentioned will suffice. With the neurasthenic and the more serious cases, such as those mentioned as having been badly hurt and roughly handled at some previous time, in short, in those cases in which it is indicated, premedication may be resorted to and in rare cases may be imperative.

One feature in analgesia and anesthesia which has received altogether too little attention by the dentist is premedication by mild narcotics.

For these cases the most suitable remedies are: Bromural, which is an agreeable and harmless sedative and hypnotic to be given to children in five grain doses and to adults in ten grain doses, from thirty to forty-five minutes before operating; chloral hydrate in one-half to one gram doses. In cases of much excitement and fear, ten drops of camphorated validol in a little water is recommended. In those cases in which more powerful sedatives, morphia, hyoscin, etc., are required it were better to consider them as hospital cases.

In the writer's experience aromatic spirits of ammonia has proven a most reliable remedy. It is given, when used as a preoperative remedy, in fifteen to twenty drop doses in an ounce of water. It is a decided stimulant, has a very pleasing effect in quieting the patient and relieves abdominal distress, if such be present, to a very marked degree.

Further preparation of the patient demands that there be perfect freedom of the clothing about the neck and chest, especially should tight collar bands be loosened. The position of the patient in the chair should be reclined until the patient is nearly, if not quite, in a full reclined position. (Shearer).

In many cases the initial prick of the needle will induce so-called needle shock. The patient exhibits every sign of ordinary syncope; may complain that his extremities are getting cold or tingling; may exhibit pallor; a perspiration breaks out upon the forehead, bridge of the nose and upper lip. Any or all of these signs may be present before any solution has been injected into the tissue at all. If the patient is not already in the fully-reclined position he should be placed so immediately and in these cases aromatic spirits of ammonia is given by the drop method. The solution is twenty or thirty drops of the ammonia in an ounce of water, and this solution is placed, a few drops at a time, upon the base of the tongue by means of an ordinary medicine dropper. (Shearer). This condition practically never will occur if the patient be in the fully-reclined position before the injection is begun. Upon recovery the injection of the solution may be resumed and usually with no further likelihood of recurrence, though I have encountered patients upon whom every prick of the needle would induce signs of "needle shock."

Very rarely in block anesthesia is more serious shock or collapse encountered, but since it is a possibility, it will be considered.

Shock is defined (Mann, Mayo Clinic, *Year Book of Anesthesia*)· "A state of general apathy, reduced sensibility, extreme motor weakness, rapid small pulse, thready arteries, irregular gasping respirations, subnormal temperature, markedly lowered blood pressure." It may arise from various diseases, surgical operations, real fear, psychic shock, accidents, intoxications. Of these causes, diseases, fear, psychic shock and intoxications are possibilities in the field of dental surgery. The intoxication arising from an idiosyncrasy to suprarenin; too high or too concentrated a percentage of the suprarenin content, or too rapid an injection of the anesthetizing solution. In these cases and in cases of procain poisoning, which is very rare indeed, but whose symptoms are identical with cocain poisoning, immediate resuscitating measures are imperative.

For these cases reliance may be had upon the following, given hypodermatically and preferably using the Mulford units: Camphor in oil, one to two grains; heart stimulant, No. 2, containing nitrogylcerin, digitalis, atropin, strychnin—or strychnin sulphate in one-thirtieth grain doses. Ether is strongly recommended and is claimed to be a specific for procain poisoning. If the severity of the case demands, hot packs at the extremities are necessary. Amyl nitrite drops by inhalation are absolutely contraindicated in cases of collapse and should be used only in such cases as exhibit a hard full pulse or a high blood pressure. Nitrite of amyl dilates the capillaries and reduces the blood pressure and it were folly indeed to further weaken a heart which already is not fulfilling its normal function as is the case in shock and collapse.

Upon recovery the patient should have absolute rest under the operator's care, should be thoroughly warmed with hot packs if necessary, and as a stimulant and resuscitating agent, hot, strong, black coffee, is strongly recommended.

THE SOLUTION

In the preface to Fisher's book: "As in all dental operations, uniform and unmarred success reasonably can be expected only when full consideration is given to the physiological and anatomic premises upon which the methods advocated are based, and if the exacting requirements of asepsis are rigorously observed in the minutest detail."

The various steps in nerve blocking technic, while not complicated as many infer and as some imply, are as interdependent as the links of a chain and none may be neglected or slighted except at the risk of failure for the operator and disastrous results to the patient. Much study may have been put on the anatomy, considerable time given to the selection of a syringe, etc., and then for the anesthetizing solution, so many of this or that tablet is dissolved in an amount of water and the solution is ready for the patient.

A consideration of the solution then includes: *First*, the water from which it is made; *second*, the Ringer tablets which render the solution isotonic; *third*, the procain content; *fourth*, the suprarenin content; *fifth*, the amount of solution injected, its concentration, and the manner of injection.

It is accepted without question that the water, which is the vehicle for the drugs, must be sterile, distilled water. To be perfectly acceptable for block anesthesia solution, the water should be distilled in one's own office in a still kept for that purpose, and should be freshly distilled at least once a week.

Distilled water which is obtained from such sources as drug stores and the like, is not suitable for our solutions. Smith (National Dental Association, 1917) reported collecting thirteen samples of such distilled water from as many different sources and as having grown cultures from all of them. Other investigators report the same findings. All these authorities are agreed that the water must be freshly, and purposely distilled for nerve blocking injections and that it must be rendered sterile by boiling for at least fifteen minutes.

The authorities upon block anesthesia are practically unanimous, too, in agreeing that the nerve blocking solution shall be isotonic with the blood; that is to say, that the solution injected shall be of the same osmotic pressure as the blood. The reason for this may be best illustrated by the following experiments:

Add to a drop of freshly-drawn blood upon a microscope slide a few drops of plain sterile water. This is a hypotonic solution and it will be observed that the red blood corpuscles greatly enlarge and practically explode until there is no semblance of them remaining. Add now, to another drop of freshly-drawn blood, a hypertonic solution, that is, one in which the salt constituents are largely in excess of the accepted p. c. in blood serum for an isotonic solution and it will be observed that the red blood corpuscles shrivel up and lose their identity entirely as blood corpuscles—appearing only as spots. Add now to another drop of blood the isotonic solution made from the Ringer tablet and it will be observed that there is no change at all in the red blood cells. (The other experiment is made with a centrifugating machine).

These conditions being true with the freshly-drawn blood we may justly conclude that the same osmotic process is active in the living tissue and this being true we may conclude further: *First*, that an isotonic solution is accepted much more kindly by the tissue with which it comes in contact; *second*, that there being no disturbance of the red blood cells at the point of deposit of solution, there is no trauma; and *third*, there being no trauma there is no afterpain. It may be said here that if a nerve blocking injection is properly made with the correct solution, no patient ever should have any pain or untoward results from the injection of the solution. When complaint is made of soreness, swelling, trismus, or pain at the site of the injection, after an injection, it may be concluded beyond doubt that the error is not with the solution but with the technic.

I shall not go into detail in regard to the various salts in the Ringer solution except to state that the normal salt solution is regarded as a tonic and stimulant; that normal salt solution with the addition of the calcium and potassium, as combined in Ringer tablets, has a direct action on the heart muscle itself, and that the combination of these salts is regarded as the best possible medium for the other agents of the solution and is insisted upon by the big majority of authorities in local anesthesia.

The procain is the anesthetic agent of the solution; is an almost white fine powder with a bitter taste, and is from seven to ten times less toxic than cocain. The maximum dose that may be injected in the average case is nine grains. This amount must of necessity be in the proper dilution and is regarded as the very maximum dose, in normal cases. It should be noted, too, that procain injected without the suprarenin content will produce a light anesthesia only and that lasting a very short time.

Considering now the suprarenin content of the solution, the writer believes that he who is seriously interested in nerve blocking injections and who seeks to derive the most pleasure from a service well rendered, will find a study of this agent fascinating indeed. In fact, I may say that the operator will find his greatest satisfaction and greatest reward in nerve blocking from a thorough study of this drug.

The suprarenin in the solution localizes and intensifies the anesthesia and prepares the tissue for the reception of the anesthetic. (Seidle). It produces anemia; it is a powerful vaso-motor constrictor; the most powerful hemostatic, and has a direct action upon heart muscle. When untoward sequela occur, it is usually the suprarenin that is the exciting agent. Seidle says, "The toxicity of the solution is due less to the procain than to the suprarenin, and the fresher the solution the greater its anesthetizing power and the less its toxicity."

Given a drug which has these powerful qualities I submit to you this proposition: That the nature of the suprarenin content demands that it be adjusted to the patient upon whom it is to be used, and not only to the individual patient but to the operation in hand and the probable length of time of that operation.

To illustrate the point I desire to make, let me state that a small percentage of suprarenin certainly is indicated in those patients in whom it is unwise if not hazardous to increase to any appreciable extent that patient's blood pressure. In patients who already are anemic it is certainly unwise to inject a large percentage of an agent which will render the parts very much more anemic. The result from such procedure may be death of pulps in the teeth in the region anesthetized; a greatly prolonged anesthesia, or if the operation be of a surgical nature there will be no hemorrhage and consequently a great probability of afterpain. It is an axiom of surgery that, the more normal the hemorrhage from an oral wound, the less the probability of afterpain and the more normal the course of healing of the wound.

Again the operation at hand may be the removal of an impacted tooth, or other surgical procedure in which a comparatively bloodless field is essential or desired. In such cases, provided the amount of solution to be injected is not great, the suprarenin content of the solution may be increased considerably. Again, if the procedure be, for instance, the removal of one tooth, an extensive anesthesia will not be desired, nor a bloodless field be essential, and the suprarenin may be reduced; or on the other hand, the procedure may be the removal of pulps, or the preparation of sensitive cavities. Since operations involving the pulp require a much deeper anesthesia than those upon the soft tissues, the indications warrant an increase in the suprarenin content. (T .00002; E .00005; F none; Procain .05). (Smith Tablets).

I am influenced to go into detail concerning this phase of anesthesia, or rather to consider the anesthetic solution in detail at this point for the reason that one finds many statements made in articles upon anesthesia, condemning or inferring condemnation upon the method of block anesthesia, with no effort at explanation as to why this or that result is obtained.

In the April issue of the *Dental Cosmos* will be found an excellent article by Blum; also there will be found an article by a Dr. Beck. I quote from this article as follows: "For two years I followed the nerve blocking method in my practice for extractions, cavity preparation, removal of pulps, etc. Under this method the operations were painless, but my records show that the anesthesia lasted from three to twenty-four hours, and many of the patients found this prolonged anesthesia so annoying that they preferred the pain of the operation to the injection of novocain." From the editorial in the same issue I quote as follows: "We do not believe that any serious result will follow in these cases, but it must be a source of considerable mental perturbance both for the operators and the patients. These fortunately rare cases we trust may be avoided when we have had more experience with the conduction method of anesthesia."

These quotations bear definitely upon the point I seek to impress regarding the suprarenin content of the solution. I regard it as entirely possible, and likewise entirely probable, that when such conditions arise as to cause one to discard such a wonderful method as block anesthesia, the fault lies not with the method but with the operator. It would seem entirely plausible that, if one obtained an anesthesia of sufficient duration to cause many patients to complain, he would seek the cause of such complaint and remedy that evil—adjust the cause. Dr. Clyde Davis said, "A great many of us do the ordinary injection as every-day occurrences but it is the failures that keep us students, and it is he who studies his failures and seeks religiously to remedy his errors, who succeeds in anesthesia."

Beside an unduly large quantity of suprarenin where contraindicated there are several other factors that may cause a prolonged anesthesia. One of these would be the use of a syringe which had been kept in an alcoholic sterilizing solution or had been rinsed in alcohol and from which all trace of alcohol had not been removed absolutely. Another cause would be faulty technic to which could be attributed the puncturing or cutting of the nerve trunk itself in inserting the needle or in undue stabbing motions back and forth after the needle had been inserted. Still another reason for an apparently prolonged anesthesia would be the injury to the nerve trunk itself in an exodontia, or other surgical procedure.

The amount of the procain is accepted in dental practice as a two per cent solution; and as I have just endeavored to point out, it is the suprarenin which should be adjusted and not the procain.

The solution should be injected slowly. Dr. Silverman insists that it should take two minutes approximately to discharge two mils of solution.—(Cary Eggleston and Robert A. Hatcher). (*Proceedings of the Society for Experimental Biology and Medicine*, New York City.)

"The local anesthetics mentioned are cocain, procain, stovain, and apothesin. The fatal intravenous dose of each of the several substitutes for cocain varies enormously with the differences in rates of injection."

One may not only produce shock by too rapid an injection, but will produce trauma at site of injection and consequent afterpain.

THE INSTRUMENTARIUM

Much has been written and many questions asked concerning the instrumentarium. This is, in the last analysis, a simple proposition, and yet a proper instrumentarium and its proper care are as vital to success in nerve blocking as is any other step in the procedure. As a matter of fact, no link in the chain of this technic may be neglected, but at the risk of failure and disastrous results to the operator and to the patient alike.

First of all then, the syringe must be of a kind that easily may be sterilized by boiling; the fewer parts and the more simple the syringe the better; and those syringes with the "slip-on hub" to be preferred.

Much fault has been found with the all-glass syringe and with the syringe with the glass barrel and metal plunger on the ground that they back-fire, or leak. While it is true that this is the case to a small degree, the matter of leaking under pressure is not a serious drawback to the use of all-glass syringe (which the writer much prefers), nor to the glass-and-metal syringe; and this fault may be condoned, if not too serious, for this reason: In block anesthesia our solution is deposited in areas of loose areolar tissue, except in the roof of the mouth, and practically no pressure is required to expel solution from the syringe. It has been well said that the weight of the piston plus one flea power is all the pressure that should be required. As a matter of fact one of the safest guides in determining needle position is the fact that the solution will flow freely from the syringe. Should the operator find resistance to the deposit of the anesthetizing solution at the point of blocking, it were far safer, and better, and wiser to make no injection at all than to attempt to force the solution from the syringe. It may be accepted as certain, that should such pressure be required in any nerve blocks, except those in the roof of the mouth and possibly at the infra-orbital foramen, the point of the needle is inserted into muscle tissue or beneath the periosteum; neither of which positions of the needle point are to be tolerated in a successful injection.

The syringe then is a matter of personal choice with the operator so long as it may be sterilized by boiling.

The needle is also a matter of choice so far as its composition is concerned. Iridio-platinum and steel needles have each points to recommend them. To the writer's mind however, the advantages of the iridio-platinum needle so far surpass those of the steel needle that the latter is not considered in his practice at all. The iridio-platinum needle may be kept mounted on the syringe as it rests in the sterilizing jar. It may be sterilized in the alcohol flame and is thus always ready for instant use. When the cost of needles is considered the iridio-platinum may prove slightly more expensive, but this item is not to be considered when the efficiency of the instrument is concerned.

Procain dissolving cups should be used and are essential to the boiling of the water and the preparation of the solution.

The syringes, properly mounted, should be kept in a sterilizing jar filled with a proper sterilizing solution. Before using they should be thoroughly rinsed in hot sterile distilled water to rid them absolutely of any of the sterilizing solution.

Other essentials in the instrumentarium are: Several pairs of small artery forceps for the handling of gauze, etc.; a package of ordinary wooden applicators; sterile gauze, or sterile cheese-cloth napkins, say six inches square, and iodin three and one-half per cent. solution.

THE INSTRUMENTARIUM

Two syringes, two needles for same, one or two procain dissolving cups, alkali free, glass bottles for distilled water, wooden applicators, sterile napkins, three and one-half per cent. iodin.

DISCUSSION

DR. THOMAS: I want to congratulate Dr. Litchfield upon the splendid paper he has given us. The Nebraska State Dental Society is to be congratulated upon having a man who will take his valuable time and devote it to research work and then give us the result of that research work. I am going to elaborate only a few points that I have found to be of importance in my work. He spoke of conductive anesthesia being a good thing in all operations as far as the patient and the operator are concerned; but there are two other factors that he did not mention that should be interjected that are of great value to those two factors—the public and the dental profession at large. To illustrate: A patient comes into my office to have a tooth extracted and I do an infiltration which possibly is only half efficient and the patient becomes very nervous. It becomes very painful and after we have worried along with that old fractured root I turn the patient out of my office with a fifty per cent. service rendered, maybe less, maybe more. The patient goes to her home and she tells her children and neighbors' children how that dentist hurt her. She is therefore causing those children to avoid a dentist as long as they can. And how many people come into your office and have said in the past, "Well, my mother was so badly hurt in a dental chair one time when I was a boy that I let my teeth rot before I would venture into a dental office." So the public is to be taken into consideration. The profession at large should be taken into consideration. You can see how it affects the profession at large. So it is up to us to adopt some kind of a painless operation for the benefit it may be to the public and to the profession at large, not alone the dentist and the individual patient.

Dr. Litchfield speaks of the afterpain and soreness. I have had a great many cases of afterpain and soreness in the extraction of third molars, but in almost every case I was able to trace that afterpain to a lesion of the tissues, an impingement on some nerve, some injuring of the nerve trunk and not to the anesthetic. In some cases, very few, I have had afterpain and continued anesthesia for probably twelve to twenty-four hours. In those cases I believe it was from leaving some alcohol in my syringe or from possibly getting some air into the field. One beautiful thing about this block anesthesia in surgery or in the removal of impacted teeth is, that your patient works in cooperation with you. Now I would like to stop here long enough to say that we must bear in mind that Dr. Litchfield is an expert in this particular line, that he has spent hours in studying this particular subject, and that in his hands it may prove a great success while in ours it does not. The thing for us to do then is to make up our minds that we are going to use it and become efficient in it. Some years ago I became interested in it, but I never had the nerve to use it on my own patients and for a long time I waited for a chance to take it up. Dr. Davis came to my rescue. He put on a short course of post-graduate work in his school and I said, "there is my opportunity." And so I went down and took this course in the Doctor's school, and he allowed us to make some injections. I have been using it ever since. I had my bookkeeper look up the records of over 600 cases, and in about two per cent. I would say I had failures, that is, it was not complete; but when I started out to do this work I made up my mind to do it and exclude other kinds of anesthesia as far as possible, because I contend that the more you do an operation, the more often you do it, the more efficient you become in it, and if I were going to cover the whole field of anesthetics, I would not become efficient in any of them—I would be a Jack of all trades. So I have been confining myself principally to this one particular kind of anesthesia. Now I am learning something every day. Whenever I make a failure I want to know why it is.

I like the glass syringe because I want to know whether there is any air in advance of my solution or not. With the metal syringe I never am certain; I always am afraid that there might be some air in that syringe; even though I may eject some of the solution, I am never sure of it. I do not use it in cavity preparation or the preparation of roots of the teeth for crowns; I am afraid of it.

DR. LITCHFIELD: Why?

DR. THOMAS: Dr. Hopper of our town, some two years ago at our state meeting in Lincoln, had prepared a cavity in that way; it was only a small cavity in the first molar. A few days after he had been down here he came down to the office complaining of the tooth in which the cavity had been prepared and we found that there had been a nerve exposed. I do not believe it is really necessary. I prefer to use hot water, having the assistant keep hot water on the tooth, just as hot as the patient can bear, keep a stream of it running, and keep that tooth as warm as possible and thereby get some anesthesia. I do not believe in cold water; it shocks the nerve. You get it hot with a stone and then shoot the hot water in and it does not change the temperature; when you shoot cold water on the tooth you change the thermal atmosphere around the tooth to an extent that you are liable to shock it, and you stimulate the nerve action instead of having it act as a sedative.

I have had some trouble with exposed nerves in nerve blocking. I have had cases where I was not able to get a thorough nerve blocking where I had an exposed nerve. Last week we had a referred case where the dentist had undertaken to remove a third molar and exposed the pulp in breaking away the tooth. The patient wanted to have both lower thirds removed and so we made a double mandibular, the tooth on the left side having been one that had had the nerve removed for a long time. That was removed very easily without any pain but the one that had been broken off and the nerve exposed we found to be rather painful when we put pressure on it. I use a little pressure anesthesia, just putting a tablet on the exposed nerve and putting a little pressure on it and in a few minutes or in a few seconds the nerve becomes anesthetized and I am able to remove the tooth without pain. Have you ever had any experience of that kind, Dr. Litchfield?

DR. LITCHFIELD: Absolutely; yes, sir.

DR. THOMAS: I was wondering why it was; I have hunted and hunted for the cause until I found the exposed nerve and then I used pressure anesthesia.

DR. LITCHFIELD: I will take that up later.

DR. THOMAS: The preparation of a patient was referred to. I think we get in a hurry too often. Before we take up the preparation of the patient I want to say that a dentist has no business to make an injection of any kind if he is in a hurry, if he has his mind on a golf game, or a ball game, or he is afraid he is going to be late to some show or something of that kind, he has no business making any injection. He must be free. He must have time to do it right. He doesn't want to undertake the injection if the patient is going to take a train at a certain time, because he is liable to fall down, and it will work against him if he does and against the method; it will work against the profession and humanity; and I had rather not do the operation at all if a patient comes in and has only a little time between trains. I had rather not do the operation at all than fail. I think the patient should be kept quiet. I would like to have a room where I could segregate my patients that are going to have an injection, or a surgical operation of any kind made, from the other patients in the regular reception room. There the patients waiting in the reception room will ask what they are going to have done, and enlarge on their experiences until the patient becomes rather nervous and it takes a good deal of psychology and energy of the dentist to quiet that patient, and I find with my own nervous system and temperament that in some of those cases I have to put my entire will-power against the will-power of that patient in order to subdue him or bring him back to a state of quiet where I can operate right and this subtracts from my efficiency. And so I would like it if I could have a room where these patients that are going to have this particular operation done would be taken where they may talk for a little while with the nurse and get their nerves quiet the same as they do before the administration of a general anesthetic in the hospitals.

I disagree with the doctor when he says that he guarantees absolutely that there will be no pain. Now maybe he can guarantee that all right and get results; but we might not be able to do it and I would avoid any suggestion that would lead the patient to believe that he is not going to have pain. I find that true in taking bites for making artificial dentures. If you say, "now close your teeth correctly," you will never get them to close their teeth correctly; but if you avoid that and allow them to close down by having them swallow or something, and avoid the suggestion that you want them to close correctly, you will get a more correct bite. And I believe the more we avoid the suggestion of pain the better it will be for our patients. We must use our judgment as to the method we are going to use. We must diagnose the case very thoroughly. We must be as caerful in diagnosing the case as the anesthetist who administers a general anesthetic. We must use our judgment, and I want to say that that word "judgment" is one that we should consider and study well. When the patient is in the chair I have been in the habit of giving the injection with the patient in an upright position. Since receiving the Doctor's paper and going over it I have experimented a little in putting my patient in a reclining position, and I am surprised at how much it facilitates the ease with which you can make the injection. The matter of the clothing I think is a very important subject and just as important as if we were giving nitrous oxid or some other general anesthetic.

DR. E. H. BRUENING: I am sure Doctor Litchfield would like to know, as well as others here, how many are practicing this method in their offices. How many conductive anesthesia people are there in the state? (Show of many hands). That looks very good. Those who left the room are perhaps not as interested as those who are here; so we are rather a select gathering and I can talk about this subject in a more open-hearted way.

There is nothing in the Doctor's paper that I can find fault with. He has familiarized himself with Doctor Smith's work through a close association with him and has added to this a careful study on his own part. He has a way of presenting the matter that is very comphrehensive. This is not a one-man job—many will add their work and experience to what has been done before the last word has been said on nerve blocking. As much can come from a small town in Nebraska as from Chicago or elsewhere, and he who feels the call of this thing and has ability, is going to bring out something that is important, as Doctor Litchfield has demonstrated to us this afternoon. Now, how can this demonstration be of the greatest value to the dentists of Nebraska? I probably take the teacher's viewpoint of this thing. The fact that one man has worked out something is not going to be of much value, if it is of a highly-technical character, by merely reading a paper and showing some slides or wet specimens to a group who are interested in that subject. They must have an opportunity to get further information on it. It is difficult to learn this work from a book. When it first came out, we found it about as interesting as anatomy used to be in college. The fact is we have an aversion towards this subject from an anatomical standpoint because many of us did not like anatomy when we were in school. We did not think we needed it in the practice of dentistry. We found in later years that we were mistaken.

In the advance of dentistry, we are finding a greater need for anesthetics. We must not be satisfied with only one. I find conditions where conductive anesthesia is just the thing, and in another case my gas machine will give me better results. We must have an opportunity to become proficient in the use of these agents to relieve pain and take advantage of it.

The one indefinite point in this paper is in regard to the suprarenin content of the solution. If we knew just how much of this to put into each soltuion to get the desired result in the case in hand, it would add a great deal to our satisfaction in the use of these preparations. This is a problem for men like the essayist to work out for us. This subject is as important to dentistry as some other subjects are today. We have got to make good. We can't side-step. It did not make so much difference a year or so ago as it does now. Our profession is being called on to help out in the great fight against focal infection which simply means, keep the people well. Preventing disease rather than treating symptoms after they arise. It has at last been recognized that the teeth are a part of the human body and the same blood flows in and around them that supplies the other parts.

The medical profession must prepare itself to pay more attention to keeping the people well rather than curing them after they are sick. We are up against the same thing exactly. Think that over. What are you going to do about it? Let me suggest that you take time from your practice to go to Doctor Litchfield and get him to teach you nerve blocking. You cannot get it from this lecture. I do not believe that you will feel like pushing a syringe needle 35 or 40 millimeters into the tissue after hearing one lecture on the subject. Doctor Smith told me that he was going to give us a book. I am hoping that he will do this soon; we need the book to refer to after we have taken the work in class. You cannot afford to let the opportunity go by to get into this work and learn it. If there is any fear on your part about putting that instrument into its proper place, better never do it. Be sure you are right then go ahead.

DR. SHANNON: I am sorry I am called, for I hoped to go through this meeting without saying a single word. I agree with Dr. Litchfield in everything he has said with the exception of minor differences here and there; and he has given a most excellent paper on nerve blocking, but I want to say to you gentlemen one thing: Maybe you don't know my hobby; I don't have many, but I have one, and that came in before nerve blocking was taught through this section of the country, and in fact I think if you will look over our records you will find that I was the first man to demonstrate painless dentistry in the Nebraska State Dental Society. But I did not do it by nerve blocking. Nerves were removed at that same meeting. There are a few points I want to touch upon before my time is up. I was criticised; some of the leading men of the country criticised my method of producing anesthesia; they said it was dangerous; they said when you put the anesthetic into the bone process you would get into trouble, you would get necrosis of the bone, you would produce everything that you didn't want. And one of those men has gone to work and is today recognizing that method of producing anesthesia of three teeth which he has to do if he gets them and gets them right. But he has perfected just a little bit of a technic, differs in a minor way from the technic which was followed six or seven or eight years ago, whenever it was we met there. But it is the same thing. He goes in in the same way, he places his medicine inside of the bony process to produce anesthesia. I am glad to say to the men here, take this up; but you have got to know your anatomy; that is the right thing and you ought to know your anatomy, but with the method I showed you here six or eight years ago the biggest numbskull on the face of God's earth can produce absolute anesthesia.

DR. ALLEN: I am myself a mere child, an infant in conductive anesthesia. I started about six months ago and I have been, I think, fairly successful. I have had one or two sad results.

VOICE: Did they die?

DR. ALLEN: I don't think they died or will die, but I think I can safely say after six months of work in conductive anesthesia that it has given me more enthusiasm and more confidence in myself as a dentist than any other one thing that I have ever tried to do in dentistry. I am very glad to have been here and heard Dr. Litchfield and I believe very much, as Dr. Bruening has said, that we cannot get this by a platform lecture and I merely wish to add to that, the more I hear the so-called platform lectures the more I realize that is true. I mean to be one of those who takes part in the begging process from Dr. Litchfield. I want to get closer to him or some man like him, because I believe that this is a very vital adjunct to dentistry and that we will all have to get busy on it sooner or later.

Dr. Beldon: I would like to ask the Doctor a question, "In what percentage of the average practice do you think it necessary to take the blood pressure of the patient before you make the injection in conductive anesthesia?"

Dr. Bolzell: I have not very much to add in regard to the paper. I agree with it fully. I had the good fortune to take a course under Dr. Smith and at that time I believe, he advocated iodin solution, fifty per cent., and I would like to ask Dr. Litchfield whether that is his procedure, whether it is the same or why he does not use full strength instead of the fifty per cent.; what takes place in regard to the tissues? I have had good success in using this and a few failures and the most of my failures were due to my technic at the start; but the more I practice it the better I figure my technic becomes because I get better results in all of the cases that I use conductive on afterwards. The point I wanted brought out was in regard to sterilizing the field, the point of the needle, and so forth.

Dr. Beeson: I wanted to say a word on the subject. I lost the point of a steel needle in the body tissue and I never lost but one; however, I was very anxious as to what the results should be; they were absolutely nil. I would like to take a little exception to the remark of my friend Bruening in regard to the suprarenin being always the cause of alarming symptoms. I presume all of you have had the experience of more or less severe shock and perhaps almost complete coma from the mere approach of an instrument to the mouth. I recall one instance very clearly where I made a remark to a young man, "I can prepare the cavity all right and will give you an appointment for the work." I picked up a hand piece, and when it was six inches from his mouth he fainted away completely. If I had used some of the solutions I might have attributed that to it, but I think that remark of his possibly does not hold good in all instances.

Dr. Bruening: I did not mean to go that far, Doctor.

Dr. Thomas: I would like to ask Dr. Litchfield what his procedure is, should he break off a needle.

Dr. Blair: In using those tablets, Doctor, how do you measure the difference in the amount that you use?

Dr. Manville: What can be the cause of the immediate lowering of the pluse, the pulse going down instead of up?

Dr. Naumann: I would like to ask the Doctor just exactly what he thinks, whether the solution should be used for just one tooth or whether it should not be used except on more. I find that comes up often in my own work.

Dr. W. Clyde Davis: I hope you will pardon me if I take a few minutes on this matter. I wish to compliment the essayist on his paper. First we want to throw a few boquets at the dental profession. It is today leading the world in nerve blocking, without question, and the king or leader in this work is Dr. Smith. We have with us today one of his lieutenants. Only a short time ago I was fortunate enough to be asked to appear before the state association of eye, ear, nose and throat men on this very subject. I was dumbfounded to find that few of them ever attempt it in any form. The last operation shown on the board, with a 44 mm. needle, will efficiently anesthetize the nasal passage and the antrum on one side making operations there for a period of two hours absolutely painless. There isn't five per cent. of the medical profession that block for a tonsil or antrum operation. Now gentlemen, will you allow this thing to slip? You are missing something. You are missing efficiency in your profession. It is something you can put to service immediately. Dr. Shannon has a point of interest and only wants thirty seconds.

Dr. Shannon: I would like to tell you what a patient said to me. Dr. Davis knows the patient; he worked on her. I had the pleasure also of working on the patient putting in seventeen gingival gold fillings for her soon after I entered the practice and I needed the work God knows I needed it or I would not have worked on her. I never had such a crazy maniac since the day I was born. I used to hate to see her come in and she used to hate to come worse than I hated to see her. She was a fright if you know what that is. I want to say that I earned five dollars for every thirty cents I got from that woman on that job. I told her I would not work on her any more. She fell into Dr. Davis' hands and I don't know the kind of a time he had with her but it must have been "some time" if he had anything like I had. She had been to Denver and Minneapolis and two men in Denver refused to work for her and two men in Minneapolis refused to work for her. She came back to Lincoln a year or two ago and came up and asked me if I would do anything for her. "Why," I said, "bless you, I would just as soon work on you as anybody. You know," I said, "I have had a change of heart since I talked to you last." She said, "I can remember what you said to me and when you told me you wouldn't work for me any more." I put the lady in the chair, made an injection, removed a pulp for her and she never raised a hand. I tell you I have stood for fifteen minutes with her holding my wrist with both hands begging me and asking me if I was going to hurt her, before that. She never raised a hand. She said, "Doctor, it is a pleasure, to come up here and have dental work done now." She told me that only yesterday, and I hope to Heaven that what Dr. Davis has said to you will sink beneath the hide of some of you men, and that you will get into the harness and learn to do the best thing you ever learned of in dentistry, not only for yourself but for your patients that are nervous and patients that are sensitive. There isn't a single one of you who can tell me that you have got patients on your list that it don't touch and that you don't hurt them. I know better. I get some of your patients and you get some of my patients and I will get plenty of them that you have worked on if you don't use it.

Dr. Davis: Any other remarks? Dr. Shannon and I have talked you all to death. We will then close the discussion with Dr. Litchfield. He informs me that he is going to be kind enough, although not on the program, to give a a clinic tomorrow morning during the clinic hour at the Creighton Dental College. We will have the wet specimens. If they are as good as the ones he has shown already they will be worth your while. Just look up his table and find out what he has and see the actual thing. It may help you to overcome just what you have been troubling over and give you just what you have been trying to get and show you how to overcome that shiver up your back at putting the needle into somebody.

Dr. Wait: I want to say a word here seconding the sentiments of Dr. Davis and Dr. Shannon. You don't want to be scared in using the needle. I am going to tell you something. A man came to our town selling needles shortly after I took this work up and I bought one of him; it was one of those stiff curved gold needles that came out. I was after the tuberosity injection; had not been doing nerve blocking such a long time. That needle worked so smooth, it kept going on up there and I kept letting it go, and I knew I was sticking that stuff somewhere; it was not hurting the patient any. Well, the result was that I had everything. "Why, Doctor," the fellow says, "my goodness, I can stick my finger in this eye and not feel it." He says, "gee whiz, my teeth are just dead." I was after a first molar gold crown with a big granuloma abscess, and of course anxious to do that work as thoroughly as possible. I did not know what I had done, but I got everything out and I whittled away up there and hurt nobody. So Dr. Sutton, sitting here, came into my office a few minutes after that and I told him about it and I said I had read an article last night where Dr. Smith at the New York meeting, told how he injected here and caught the second division. "Well," I says, "I caught some division, but I don't know how I did it." Dr. Sutton wrote Dr. Litchfield right away about it, to know what Smith said and what I had done. Dr. Litchfield's answer as to what I had done, in reply to that letter, was the very words he gave you here today in blocking the nerve with the 42 mm. needle. I have been doing that same thing ever since, only a little more scientifically than I did at that time. It was more or less accidental you might say. Since then I have read Dr. Stearns' writings upon the subject and in the meantime I had read Fisher and others, and Dr. Litchfield and I have passed many letters and remarks in regard to this work and there is no reason in the world why we need to worry about it. The patient may be a little sick sometimes but I haven't had any particular trouble. I don't think you will. You can all do it.

Dr. Litchfield: You know I am realizing more and more that this is a sample clinic. I am only starting. We are just getting ready to get into nerve blocking. In the time I have had we have just simply hit the surface. I am going to try to answer the questions asked; I won't dodge any of them and I will tell you if I cannot answer them and do not know anything about it. I am very grateful for the reception of the paper and clinic. Dr. Davis mentioned nerve blocking for the nose and throat. I did not begin, nor could I begin, to go over the things that can be done with block anesthesia. We block the middle and posterior palatine nerves in the zigomatic fossa with a needle shaped like the needle with which we do the second division blocking, but 10 mm. shorter than that, the barrel of the syringe resting on the occlusal plane of the upper teeth, depositing two to three cc. of your solution and securing an absolute anesthesia of the palatine nerves that supply the posterior nerves at the upper border of the tonsil and sometimes farther back than that. With two cc. deposited in what is called the posterior lateral base of the tonsil we can do an absolutely painless tonsillotomy. And as Dr. Davis says you will be surprised at the physicians that don't know that that can be done. In the classes it has been my pleasure to act as assistant to Dr. Smith. We recently had some nose and throat men take the course for that one injection at fifty dollars per, and tickled to death when they got through at the demonstration. Now Dr. Thomas mentioned air. I would like to set your hearts at rest if I can by saying, if you have air in your syringe, a whole cc. of it, go ahead. If by any mistake you shoot that air into the tissues, go ahead; your patient won't ever know. Don't any of you believe they do. Dr. Smith had a dog on the table and it had gone through with the things that they wanted to know, the blood pressure test, and heart test, and respiration test, and the dog fulfilled his purpose; and to see what air would do they pumped air into that dog, Smith says, until they could have swelled up a five hundred gallon bag, and never fazed the dog at all; he got well. Some one spoke about the age of the patients. Our patients are as young as five years of age and up to seventy-six; with children if I can do the psychotherapy stunt enough to get the needle into the mucous membrane, I am safe and the child is going to have an absolute anesthesia. I had a young man in the office with one of the prettiest cysts you ever saw; the sack would go around a one ounce bottle after I had removed it; it involved the cuspid, the first and second pre-molar teeth and was attached to the first bicuspid. It was removed. I told the parents of this boy that if I could get his confidence enough to start the needle into the soft tissue that I would not hurt him a bit. We made the injection; I packed the boy with gauze and cotton, we took out all the teeth and the cyst, curetted the bony tissues and he never had a pain during the operation or afterwards.

Now a question was asked as to the removal of third molars and afterpain, especially if they be badly impacted. The afterpain is due to one or both of two things, trauma and infection. If the side of the projection be thoroughly cleansed, asepsis be rigidly and religiously adhered to at every step, there absolutely will be no pain which comes from the nerve blocking injection. If there be pain it comes from an infected socket or trauma. If that trauma be back into the soft tissues where the needle point is resting, and if that needle point has scratched or punctured a nerve trunk there will be trauma and prolonged anesthesia. But in an operation such as the removal of a third molar, and especially if it be impacted, we are indulging in a surgical procedure and we have a severe wound, and if we have used much suprarenin and have a bloodless field you can promise that patient pain after sensitiveness returns, and it is absolutely due to the surgery of the procedure and not to the nerve blocking.

There is a reason why you fail. It is not your patient. It is not the solution. It is the operator, and if there be no result from an injection, do another injection and find out first why the first one don't work. I have made two injections lots of times. Now Dr. Thomas took me to task about promising a patient no pain. I do not say always that

I promise a patient no pain. Sometimes I promise a patient nothing, but you will sometimes have a patient who will insist that he must not be hurt. I take a gamble with that patient and guarantee absolutely that he will not be hurt and if I do promise that I see to it that he is not hurt. Don't promise him that you won't hurt him and then take his head off. Quit and tell him you cannot do it or you are going to hurt him a little bit. But if one is well versed in his anatomy and has confidence in what he is going to do I honestly believe that you can promise that man that you won't hurt him and when I promise him that I won't hurt him I am not going to hurt him if we have to block him two or three ways. The idea that I am trying to convey to you is, get the confidence of your patient and retain it. If a patient presents himself with an acutely abscessed upper first molar I will tell him I will do the best I can; I won't promise not to hurt that man but in other cases in which the prospect is favorable you can promise the patient that he will not have any pain. The whole thing is more or less a question of psychology between the patient and the dentist, and if you think you have a good chance not to hurt him, if you tell him that he will have no pain, if you can make him believe that why if you hurt him a little bit he would not know it. But if you tell him, "now maybe this thing is going to hurt, I couldn't say, maybe you will have some pain", he is going to have more or less pain in a large majority of cases. There is, as I said in my paper, a great deal of psychotherapy in these operations.

Dr. Thomas speaks of having no anesthesia where the nerve has been exposed. It takes a far greater depth of anesthesia in working upon nerve tissues in the teeth than it does working upon nerve tissues in the soft parts. Very frequently it will be impossible to remove a pulp where the pressure anesthesia assisting the nerve blocking will render the parts absolutely anesthetized. As Dr. Bruening said I approached the suprarenin content with fear and trembling. That is the first way I have heard it broached in the way that I included it in my paper, but I am convinced that in the further study that will take place in regard to the suprarenin content there will be a balance found so that the suprarenin content may be adjusted. Some man asks how you know that. I use or have on hand tablets without any suprarenin; I have on hand tablets containing one proportion of suprarenin and others with other proportions. One can take a given amount of Ringer's solution if you please and he may use one tablet which will give him a two per cent. solution of cocain without any suprarenin in it; he can add to that solution one T-tablet or a tablet containing the suprarenin; he can prepare the solution with only the amount of suprarenin that is contained in one T-tablet, or make it so that he will have one-third less than he would have if he used the T-tablet. You can adjust the balance in other ways and it is pretty hard to absolutely balance it.

Dr. Bruening refers to the gas oxygen. There is a field for that and for nerve blocking and they ought to go hand in hand. One patient may be a patient for nerve blocking; the next patient may be a patient for the gas machine. Now about the suprarenin again and the balance of the suprarenin. You will find a patient now and then. In men and women who have good complexions, who look as though they have some circulation, and a normal blood pressure, and a man using the amount of suprarenin there is in an E tablet, and taking the whole method as some of us have to do in the smaller places, we will find that many, many times the patient will report no pain; probably no afterpain; but a headache for two days, and I am convinced that it is the suprarenin that is making the headache and increased blood pressure. Is that a good guess, Dr. Davis?

DR. DAVIS: I think it is.

DR. LITCHFIELD: Now when to take the blood pressure. You know we don't all practice in Omaha; we don't all practice in Lincoln. We haven't all of us access to a hospital and, I am sorry to say, to a doctor that knows a blood count or a blood pressure when he sees one. But if I were where the facilities warranted it I would want a blood pressure and I would want a blood count of every patient from whom I was operating if that patient was suffering from a focal infection. That is the only way we could tell absolutely what we were doing. That is the only way we could tell whether or not we have secured a vaccination, whether we have got an increase in the leucocytes or not and I would take, in answer to that question, the blood pressure of every patient that reported to my office that was sick. That may be going the limit but that is the way I would like to do. Now I use the tincture of iodin that comes from the drug store and I put it in my bottle and add just as much distilled water as there is tincture of iodin and you will find that the mucous membrane don't exist so delicate that that solution would raise a blister and it will disappear in just no time. Colorless iodin has been recommended. The stronger the iodin the more chances of a blister, but the three and one-half per cent. solution of iodin with the water contained in the antiseptic will cleanse the tissues and will act more or less as an anesthetic upon the mucous membrane. Benzol and iodin have been recommended but the benzol has such an awful odor that I have discarded it. Now the lost needle. Gentleman, no man ever ought to stick a needle into a patient up to the hub of that needle; that is a serious mistake. The needles should be so long that after you have reached the point desired, the point of the deposit of the solution, there ought to be at least 10 mm. of your needle remaining out of the soft tissues or extending from the soft tissue to the hub. In this article by Dr. Blum in the April *Cosmos* he considers seven breaks of needles. Some of them didn't break at the hub. That is because they were all-steel needles anyway and always because the needle had disintegrated at some point so that it was weaker along the shaft. Faulty technic is accountable for the broken needle. If you have the needle sticking into the patient and the patient opens his mouth and it is not a very strong needle there is a pretty good chance that the muscle will break the needle. But if the needle be in the proper place, not in muscular tissue, and if the end of the needle attached to the hub be out of the soft tissue, I think there never will be any chance of leaving the needle in the tissues or having to dig it out. I never have broken a needle in the tissues in all the nerve blocking injections that I have made. That is the only thing that scares me and the one thing that I watch more closely than anything else. If the needle be broken what procedure? Again I refer to the article by Blum. The patient is X-rayed and the needle is located as absolutely as possible, infiltration is resorted to around the needle but it takes a surgeon to get it. That is it is not a procedure that one should tackle unless he feels pretty confident of the position of the needle and can fairly assure the patient that that needle will be removed. There is a question what the cause is of the pulse going downward instead of upward. The cause is shock. I covered that in my paper. And that shock may come from the suprarenin content, it may be psychic shock, it may come from absolute fear, it may come from a faint but in true shock the pulse goes down, gets weak and small and thin. The pulse will increase because the patient is excited and nervous and it will whip up, but if your patient's pulse commences to get weak and commences to retard you may depend upon it that it is time to do something for him and do it pretty quick. Now about blocking for one tooth. No one insists that you do nerve blocking anesthesia. You may do infiltration if you wish but it is the poorer method. If it be necessary to block the maxilla we will say with an interosseus orbital injection and with a lingual infiltration to get one tooth I would not consider it necessary, but if I had a patient in whose mouth a bicuspid should be removed, if I was confident that there should be no granuloma and no infection in the region of the biscuspid teeth, I would infiltrate buccally and lingually. Now I knew Dr. Shannon way back in '64 at the Western Dental College and he was just as fussy then as now. Nobody in advancing the benefits of nerve blocking is knocking Shannon's interosseus anesthesia. We have simply a good method which we are recommending to you; that is all. These are the little instruments that Dr. Smith uses in interosseus anesthesia; this is used in the region of the bicuspid teeth and in that case interosseus anesthesia is the best anesthesia.

Dr. Shannon: If it is the best there why hasn't it a place some where else in block anesthesia?

Dr. Litchfield: I haven't time to answer that, except to say: in block anesthesia we reach nerve trunks absolutely through soft tisues in which there is no pain and secure an absolute anesthesia of a large area; and in the bicuspid region we cannot do that

There is no fault to be found with interosseus anesthesia if one be an adept in that method and I am not attempting to quarrel with the method. It is a good method and a good anesthesia but you will find this: You will acknowledge that the blood supply is less in osseus tissue than in the soft tissue. You will get a larger kick from your suprarenin in your osseus tissue than in your soft tissue. You will get shock easier and oftener doing interosseus anesthesia than you will nerve blocking anesthesia, and to me those are sufficient reasons why I regard nerve blocking anesthesia of a nerve trunk to be preferred to interosseus anesthesia. These are the instruments that Dr. Smith uses and Dr. Shannon demonstrated his method and it is a nice method. This is a different way of doing the same thing and no effort is made to quarrel with him about it. It has its place and what we are trying to do is point out the measures to take in the case in its place. If there are no more questions I think this will close my discussion.

DR. DAVIS: I would like to ask one thing, that is, why fifty per cent. of iodin is better than the full strength.

DR. LITCHFIELD: I got that last fall from Dr. Davis right there in Lincoln; pardon me for not giving you the credit. It is the finest thing ever.

DR. DAVIS: Many people think absolute alcohol is an antiseptic. It is not. You can grow cultures in it. The fifty per cent. to sixty-five per cent. is one of the best we have in dentistry. Take tincture of iodin and add water to it. It is the one all hospitals rely on. Don't forget it. When you want to get a surface antiseptic a fifty per cent. tincture cannot be beaten.

THE SIGNIFICANCE OF VITAL PULPS AND HEALTHY PERIDENTAL MEMBRANES*

BY JOHN H. PHILLIPS, D.D.S., NASHVILLE, TENNESSEE

THERE ARE TWO DOORS which the dentist should guard with eternal vigilance if his walk is to be worthy of his vocation. These doors lead, one to the dental pulp and the other to the peridental membrane. The enemies seeking entrance to destroy these tissues are the most dangerous ones the dentist is called upon to fight. When first they knock for admission they are so crafty, and withal so free from all appearance of guile, that they often are permitted to pass in without serious opposition. The dentist often may regard them with indifference, sometimes, even with contempt. He may address them like this: "Why, I am not afraid of you. I easily can repair any damage you may do. You can't get ahead of me, I'm a man of Science." Well said, Mr. Dentist; indeed you are a man of science, or, are supposed to be, and should be able to accomplish all you say you can do. But, do you always make good such a boast?

So, these enemies often are permitted to enter the poorly-guarded portals and begin their evil work, the dentist, and patient too, for that matter, not realizing that the patient has become host to thieves and robbers and sometimes murderers; that in their wake follow the alveolar abscess and the other thing which we all know as pyorrhea alveolaris.

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*Read before the Tennessee State Dental Society, September, 1919.

Time was when we did not regard alveolar abscesses as a real menace to the health of the patient. We treated them; we cured them—so we thought and taught. We were living in a fool's paradise. Now, that the facts have come to light, we no longer regard lightly what has been proven to be a dangerous focus of infection. We are walking in a new light in which the darkness of the not remote past is being dissipated. We are striving diligently, many of us, to set our house in order, but how are we going about it? Are we not in danger of becoming so engrossed in fighting the terrible enemies within our gates, that we may neglect to protect the portals of entry where the fight, though almost constant, is not so arduous? May we not pay so much attention to the abscess and pyorrhea that such things as dental caries and gingivitis may be somewhat neglected? I put this question in all seriousness. Of course, these serious conditions must be considered; they must be handled as promptly and thoroughly as possible, and, by the way, that is a man's job. But, what of dental caries and inflammation of the gingivæ?

Dental caries can be prevented almost entirely on smooth surfaces of the teeth through prophylactic measures, provided the patient will cooperate intelligently with the dentist. The progress of dental caries, if not permitted to go too far, can be arrested by the dentist and its ravages repaired. In his efforts in fighting the enemy at this door, howevery, the dentist often is guilty of kicking wide the other one. If he has fallen a victim of the speed mania, he may be so careless as to leave fillings poorly formed, unpolished, with no contact at all, or merely a stab at it, or huge chunks of overhang at the gingival margins. This sort of thing is not only kicking wide the door but actually inviting the enemy to enter—the enemy which is very often regarded with indifference, seemingly with disdain, a thing too puny and insignificant to merit the serious attentions of the busy dentist. And yet, gentlemen, we are having to do with the still small voice of the dreaded pyorrhea. The dentist who falls into such habits of practice, as referred to above, was taught the great principles of the preparation and filling of cavities from beginning to end, during his college course. He left college full of lofty ideals, anxious to apply these great principles in his service to humanity. Now, we find him drifting further and further away from his teachings, with his former ideals a total wreck.

What is the matter with this fellow? He is always ready with explanations and even a justification for his doings. Excuses are abundant. You have heard them; so have I. He has such an immense practice and so many patients to serve, he just hasn't the time to give to each operation. Those principles taught in the schools are so exacting on the time and skill of the dentist, they are not practical for the busy operator. No, no, they are not practical at all. Rubber dam? No, he hasn't used one in years. Doesn't need it. Cutting instruments? Hasn't time for them. Does everything with burs and stones, round burs, of course. No, he does not polish his amalgam fillings. Why, that would require a second sitting, and besides, his fees do not justify it.

Let me give you an equation. Speed mania plus lowering of ideals equals danger to the patient. Let me make this a little stronger. In the light of recent findings, I do not hesitate to make the statement, that in our cemeteries there are marble shafts which are but monuments to the carelessness and inefficiency of some of our very busy dentists. Do you doubt this? Then what of your reasoning from cause to effect?

The health of the peridental membrane is so dependent on the proper handling of dental caries that it cannot be considered as an entirely separate matter. However, there are other sources of danger to this membrane which must be reckoned with. I refer to deposits of salivary and serumal calculi in particular, and to ill-fitting crowns, clasps and partial dentures incidentally. Our same busy dentist may do fairly good work in fillings, inlays, crowns, etc., yet leave deposits about the necks of the teeth, even of those who have been his regular patients for years and years. Probably, at each periodical visit of these patients he will scale a little tartar here and there and brush the exposed surfaces of the teeth, especially the labial, leaving dangerous deposits beneath the gingivæ in the embrasures and on the lingual surfaces of the lower biscuspids and molars. The patient then is given a hand mirror to view the transformation. "Fine," she says, "They look all right, doctor, and feel so much better." The patient really thinks her dentist has done his full duty, and even though trouble may arise in the future, he is held absolutely guiltless. Now under such conditions, when the peridental membrane becomes involved and pockets develop, who should bear the greater share of the blame?

The old habit of the average dentist of making a charge for filling with cleaning thrown in should be despised and forgotten. The time never was so propitious for adequate remuneration for the scaling and polishing of the teeth. After so many years of preaching to the public about the dangers of neglecting the mouth, if the wide-awake dentist cannot convince his patients, at least the better element of them, of the value of such services, he most certainly is not convinced of it himself.

I have mentioned "speed mania," and "lowering of ideals." Let me say a few more words along that line. To my way of thinking these two evils are too prevalent among us. They usually go hand in hand, and strike at the very roots of professional ethics. The soil from which they spring is greed for gain, and a desire to make the hour yield the greatest possible number of dollars. They have no part with such ideal as *service first*. When at the mercy of such a fellow the poor little helpless dental pulp and the unsuspecting peridental membrane haven't a ghost of a chance. In summing up the life work of such a dentist, placing the good he did over against the harm he did, there is a question in my mind as to whether the harm would not overbalance the good. He most certainly does not elevate the profession, but is engaged in tearing down what others are striving to uphold.

In closing this paper, permit me to quote a few sentences from an address of Dr. Downing, of the Board of Regents of the University of the State of New York. Speaking before the National Association of Dental Faculties last summer in Chicago, he had this to say about a profession: "This implies professed attainments in special knowledge, as distinguished from mere skill, and the practical application of such special knowledge to use for others, as a vocation, as distinct from its pursuit for one's own use or benefit. It implies specialized knowledge and peculiar skill in the application of that knowledge, not for the benefit of one's self, but for the use of some one else. All the altruism of professional life is summed up in that definition, whether one is a physician, a dentist, or a lawyer, or veterinarian. If you claim the title of a profession for your vocation, you have surrendered forever for that vocation, as a primary purpose, your own benefit, your own aggrandizement, your own self; and, you are morally bound, whatever the profession may be, to take into account first, those others whom that profession is to serve."

DISCUSSION

Dr. Geo. L. Powers, Paris, Tenn.: I congratulate this Association, and I congratulate the Program Committee, and I congratulate Dr. Phillips, upon this splendid paper; a very delightful, very instructive and well-rendered paper for an opener.

In taking up the discussion, rather in opening it, I must say, in defense of myself, that I have been so busy as secretary—and any of you who have been secretary of this Association know how busy the secretary is—I have been unable to give this paper any thought whatever, but I am glad to stand here and say just a word or two relative to the subject.

My friends, we are living in a wonderful age. We are a happy or a fortunate set of professional men, fortunate in the fact that we live and practice in this age, at this time; fortunate in the fact that we belong to the dental profession. To my mind, I feel that there is not a greater profession extant. This has been demonstrated so many times, especially in latter years. I feel that there can be no objection to the statement that dentistry must be, if not the greatest profession, certainly right up there at the top. We have more intelligence as a profession than we ever have had; we have gone into more research, and as a matter of course, we know more than we formerly did. We have had greater opportunities. Along with those opportunities, along with those advantages we are having of present-day intelligence, research and information, comes a wonderful and corresponding responsibility upon us as professional men, and I wonder if each one of us bears up our proportion of that professional responsibility. We, as a profession, we, as individual professional men, have a most wonderful opportunity to make ourselves from a standpoint of service to the public, what we will, irrespective of our conditions, of our environments, of our former history, we can, we should, and we must make ourselves the biggest possible professional men we can. It used to be that we had no better sense as professional men than to think it was wise to remove pulps of teeth *ad libitum*. We used to have no better sense than to neglect the prophylactic treatment of mouths and look only toward the correction of diseases, paying no attention to prophylaxis. In the present day, we know better. We have decidedly learned better sense than to remove pulps. We should put special emphasis with our patients, with ourselves upon that important feature of our profession, prophylaxis, or preventive measures. I have heard dentists say to a patient: "I will make this many fillings for so much." Or, "Oh, here are two or three little ones, I won't charge you anything for doing those." Now, that is a grandstand mistake. We ought to impress on that patient's mind the fact that those small cavities are the important ones. If we are going to charge anywhere, we can be of better service to patients by charging for those smaller cavities, emphasizing the importance in other words, of taking the thing while it is young, sealing up, stopping those small cavities before they have extended far enough toward the pulps to cause their inflammation and ultimate death. Then we are of much more importance to our patients if we prevent inflamed conditions of the gums, peridental membranes, than if we let them go along, without the information we could furnish patients, until they get into a condition of pyorrhea, because when they get in that stage, as you know, while we sometimes can relieve it, oftentimes we can relieve the condition only by extracting the teeth.

Now, when we know our responsibilities, our holding of human lives within our own hands, within our own directions, within our own intelligence, why will some of us, as professional men, go along and not have the nerve, or not have the salesmanship, or not have the whatever it is lacking, to introduce that patient to preventive measures? I would great deal rather charge a patient five or ten dollars for a prophylatic treatment, than to neglect that patient and not show him the pits he is likely to fall in, and later come along and get five, ten or fifteen dollars for a pyorrhea treatment. Now, when we see the results every day of our lives of the diseased conditions produced by dead pulps and by pyorrhea—pus conditions—when we know those things, when we know the inevitable, why will somebody neglect to prevent those things?

I had a case a short time ago, a lady who had been neglected in former years, from her mouth standpoint. She had drifted into disease. She had been treated quite a long time by her family physician, with no results excepting continuously getting worse. She happened to have trouble in her mouth, and I was called in consultation. I pressed on the gums of the woman, and you know what sometimes happens—a quantity of pus oozed out. I called the physician and I called her husband to see that condition. The woman was paralyzed from the waist down, besides suffering with rheumatism in other portions of her body. I said, "I don't know whether that is the cause of this trouble or not, but certainly you never can relieve that woman with this pus factory going on." She reluctantly agreed to have those teeth removed, taken out, from one to three at a time until about four or five were extracted. After three months, simply by relieving that infectious condition, which gradually was pulling that woman's system down, the woman is walking.

Now, I relate this simply to emphasize the importance of his paper along the line of the preservation of the dental pulp and the peridental membrane, maintaining healthy, normal conditions along that line.

Now, if it were nothing more than preserving these two things, it might be different; but, that is the least of it. The result of not preserving those things in the way of general physical abnormalities and disease, is what we are striving for. Because we remove the pulp of a tooth and fill that tooth, as we think, perfectly, and that tooth doesn't give trouble or give that patient inconvenience or pain, we need not think that tooth is not giving that patient trouble; we need not think that is not a place of infection. Now, if any of us get the idea into our minds that those things are normal and all right, just put your X-ray to them, and see if you don't change your mind.

Dr. John R. Beach, Clarksville, Tenn.: I want to protest against the essayist making the statement that owing to speed mania the profession is void of recognizing the significance of vital pulps and healthy peridental membranes. I do not believe there ever has been a time in the history of the profession in the State of Tennessee and also the profession at large, when we did not recognize the importance of this work. There may be a few here and there possibly, owing to this speed mania, as he says, or who possibly may not have the time that it may require, who might not do this work, but taking the dentists as a whole, I believe positively and firmly that we are rendering good service to the State of Tennessee and to our patrons, and I believe this should not go abroad, that we are neglectful of our patients, but that we are rendering such service as we are capable of rendering, and that we make ourselves capable of rendering the best service possible.

DR. J. L. AUSTIN, Chattanooga, Tenn.: I enjoyed Dr. Phillips' paper very much, especially coming from a man who has been considered as conservative as has Dr. Phillips. There is no question but what we today live in the greatest time that dentists ever have lived. Those of us who have been practicing a few years remember very well when the theory of focal infection was first accepted by us as a profession. Of course, there had been theories advanced but it was not accepted until just a few years ago, and those of us who now refuse to accept it close our eyes and refuse to see. There is no question about it, that as Dr. Beach says, if this should go abroad, probably it would do our profession a little harm, but, it is nothing but justice to our profession that these statements should go abroad. We are guilty of it, and why should we not be criticised for our guilt?

DR. JOHN R. BEACH: I say we are not guilty, Dr. Austin.

DR. J. L. AUSTIN: I think we are.

DR. JOHN E. BEACH: You may be.

DR. J. L. AUSTIN: You may not be, but there are a great many here who are—a very large per cent. There is no reason today why dentistry should not be on as high a plane as medicine. The pendulum has swung; it is true it has swung very far. A great many medical men feel it has swung too far, because they have sent their patients to the dentist; he is supposed to correct these conditions by extracting. Probably he has extracted in the same slipshod way that he has done a great deal of his other work, without eradicating the infection; the patient gets no better, and the report goes out that she has had her teeth removed and is still in the same condition. A great deal of that, gentlemen, is due to faulty work in removing those teeth. What Dr. Phillips said about the prophylactic treatment is true. The important treatment of all is prophylaxis. The next important thing is to take care of your tooth decay, or old cavities, as early as possible, so you will run little risk of injuring the pulp. I do not think a man is excusable in removing the pulp of a tooth to put any kind of work in any man's mouth. I am not saying he is never excusable in removing the pulp to construct some piece of work and merely anchor it in the mouth, but I do not think he ever is excusable in removing the vital pulp. I think, as Dr. Powers said, about the X-ray. Get your X-ray, turn it on, and see what you think about it; take a look, and a great many times you will be convinced that you have infection, when you would not have known it but for the X-ray. I heard one of the most prominent men in the profession earnestly say that the only thing he wanted with his X-ray was to determine whether or not he had a dead tooth, and when this tooth was found to be devitalized, he had only one procedure. I do not know whether we have all come to that particular point, or that any great number of us ever will go that far, but each year we are approaching closer to that one theory.

DR. J. H. Phillips, (closing): I am glad to know that there is one man here who will get up and say he is not guilty! Well, there are others here, of course. I am not after the man who keeps the mouths of his patients absolutely clean, finishes his fillings, absolutely polishes everything, and leaves no overhang, his crowns fit absolutely, his partial dentures produce no irritation, and even with the Yerkes telescope you could find no particle of tartar around the teeth of his patients. I am not after that man. I am glad to know we have got them. (Applause and laughter). Dr. Beach is one of my good friends; I thought a great deal of his father—more of him that I do of the young man—

because the old man was a lovable old fellow, and he never said anything about me like he said over there. (Laughter). But this speed mania I brought up was mentioned for a definite reason. Gentlemen, for the past seven years, I have been observing the work of the other fellow very closely; I have been in a position where I had a rare opportunity, and some of you Nashville dentists would be surprised—I don't know whether you would be surprised or not, but you would be embarrassed—if you could see some of the things that I have seen come from your offices. I have seen some of the finest work I ever saw in my life—mouths that were brought to our college clinic. I have seen work from all over this part of the state, and from other states, from the big man and the little man, from the absoluters and from the non-absoluters, from the stand-patters and from the progressives, as it were; I have seen good, bad and indifferent dentistry; and going back over the nine years of my practice, I can look back over that period and I can see where I was falling down every day myself. I did not keep the mouths of my regular patients as I should have kept them. I was not as careful about the preservation of the dental pulp or the integrity of the peridental membrane as I should have been; I did not realize the importance of that as I do now. Today, we have no excuse for neglecting these things. We know what to do. It is a question of "will we do it?" Have we got the gall, have we got the moral courage to lay aside the dominant idea of dollars and place in its stead that of service to our patients? We will be willing, when we get to that standpoint, to put the necessary time on a nerve operation. What would you think of a physician who was so busy he did not have time to do anything but look at the patient's tongue? "Let me see your tongue. That is all right," and go ahead and prescribe what he wants, prescribe and go on—"will come and see you tomorrow." The man that is in such a hurry that he won't take time to see a man and prescribe the very thing the patient needs, you would pass up, wouldn't you? Our duties, I will say, are just as important; we are obligated to the extent that the physician is. We have the health of the patient in our hands, and we shall have to give an account some day. The trouble is not that we do not know what to do, as I have said before, but that we have "fallen from grace," as it were— and some of you Methodist brethren will know what I mean when I say you have fallen from grace. These fellows practically are taught all alike in the colleges. Take the curricula of the dental schools of today and look over them; you will see what they are. Those fellows are not neglected; they go out knowing what to do, but it takes moral courage to do that in the face of the desire for gain, for dollars. That is certainly a mistake I think. That fellow that does the right thing all the time and takes his time will get to the position after awhile where his fees will be higher than any other fellow; he can get what he wants.

I wish to thank those who have discussed my little paper. I appreciate the remark s very much. I expected a great many more knocks. Dr. Beach is the only man who has said anything adversely, and I certainly appreciate that from him. As I said to a member, the other day, "I want you to punch holes in it; I want you to punch it full of holes." As he might have said. "Well, I just have not had time; I don't know where to hit it first."

THE RELATION OF MOUTH INFECTION TO SUB-ACUTE SYSTEMIC DISEASES—THE SEQUELA OF ORAL INFECTION*

BY CARL D. LUCAS, D.D.S., INDIANAPOLIS, INDIANA

EVERY VARIETY of bacterium which may invade food stuffs, water and all liquids, bacterial flora from cooking utensils, dishes, drinking vessels, fresh fruits, candies, tooth brushes, nuts, etc., are being taken daily into the mouth. Even the germ-laden air which we breathe is inhaled occasionally through the mouth.

Ninety-eight and two-tenths degrees Fahrenheit and a moist field seem to be the favorite environment for the metabolism of most germs; therefore, the mouth with its decomposing food debris, exfoliated, devitalized epithelial cells and mucous plaques, plus calcific deposits upon the teeth, is the only perfect incubator for micro-organisms. Over three hundred strains of germs have been isolated from normally healthful mouths.

Plus the above smudgeon of reeking filth, nearly every human mouth contains one or more devitalized, or more properly speaking, pulpless teeth; and within the pulp canals of such teeth, we have proven by laboratory and animal inoculation tests, are being perfectly nurtured specific micro-organisms in a perfect pabulum of devital, organic, putrefactive remnants of tooth pulps; some of these germs hematogenic anærobes and others ærobic in teeth which have cavities in them which expose the pulpal cavities.

The above cloud upon the horizon of human intelligence may be further blackened by the neglible practice, so prevalent among ultra civilized classes, of promiscuous osculation, which is a malignant practice conducive to the transmission of infection from the possessor to the receptor.

Why the fœtus is born alive, why it retains vitality and grows in spite of its unsanitary surroundings, contaminated food stuffs, matures to manhood or womanhood, and why the adult develops mentally, physically and morally in such constantly-contaminated environment, can be explained only by the practical theory of the survival of the fittest.

A constant battle is being waged in the human economy which is far more sanguinary than the human strife for democracy, personal liberty and freedom which was waged in Europe for so many years.

The proven theory of immunity manifested by the vital antigens in the human blood is the mighty army which may be stimulated to invincibility by carefully planned preventive measures of medical and dental science. Therefore, it behooves the two professions to work hand in hand toward the possible extermination of some of the foes of human happiness and health.

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*Read before the Miami Valley Dental Society at Dayton, Ohio, October, 1919.

Primarily, the moral obligation of each medical and dental practitioner is the prevention of disease; but this is not always possible on account of the lack of cooperation of the layman, plus his ignorance of the possibility of disease-prevention by proper living, correct diet, exercise, fresh air, pure food and water, sanitary surroundings and personal hygiene. Therefore, our first duty to the public is to educate the masses by presenting the possibilities of safeguarding their general health by their personal endeavors along the lines of correct methods and modes of living.

Many individuals today are suffering the sequela which result from minute foci of infection which constantly are draining into their circulatory systems, positively preventable by the elimination of such locked-in infections. Possibly ninety-eight per cent. of these chronic conditions are due to infections of the mouth, nose, throat and accessory sinuses. Consequently, our first endeavors should be directed toward diagnosis of such foci and their elimination, rather than the treatment of the conditions *per se.*

The Minute Man of the Medical Profession is not essentially a therapeutist, but rather a wide-awake diagnostician, who feels it his duty to locate the cause of disease, prescribe the immediate eradication of the cause and, possibly, assist physiological reaction by prophylactic and therapeutic treatment.

Prophylaxis instituted before focal eradication is similar in virtue to building an open sewer which readily becomes congested by precipitates which are deposited within its course. The immediate result of such treatment soon reverts to the original condition, and our time not only has been spent in vain, but also the patient is rendered susceptible to remote infections by the resultant lowered physical resistance due to the retention of toxins which constantly are draining into his circulation.

The first reaction to inflammation which results from toxic inoculation is manifested by the clinical symptoms of rising temperature and a feeling of malaise. Subsequently, we note a falling in temperature below the normal, which indicates that the process of the formation of antigens, the combative forces of the body fluids, is not in direct proportion to the multiplication of the invading organisms and their eliminated toxins. If the patient's eliminative functions are stimulated therapeutically, some of the toxins are expelled and the process of immunity thereby is assisted, being relieved of a portion of the toxic load. But these measures are inadequate and not practically scientific.

A blind abscess at the root of a tooth is a constant source of general systemic absorption of its toxins; and through systematic scientific investigation we have learned that all therapeutic measures at our command are incapable of completely devitalizing the invading organisms which produce toxins.

The simple extraction of the abscessed tooth has the merit of establishing a temporary drainage for the egress of the active infective agents; but complete elimination of the focus of infection never can be accomplished by this faulty technic. An incision made into the center of the abscess would accomplish the same result. In either case the drainage would become occluded by the formation of cicatricial tissue. Assuredly the stab-drain would close more rapidly than the tooth socket; but both operations, or either of them, would not mechanically remove the infected granulum at the apex of the socket; therefore, after the wound in either case has closed, absorption of toxins from the organisms remaining in the infected granulation tissue would ensue.

One or more oral foci of chronic infection may exist in an individual's jaws for a number of years before systemic sequela, such as myocarditis, endocarditis, arthritis, nephritis, iritis, neuritis, myositis, insomnia, or a general feeling of malaise may be manifested. For, the patient's physical resistance, and the stress of prosperous business, plus the psychological exhiliration and its confrere, the exhileration and the nervous energy imbued by success, combined with his physiologically-raised immunity to the focal infection, are more than equalizing the toxins absorbed or partially eliminated. But, if the patient should suffer a temporary lull in business, financial worries thereby becoming exaggerated, and he should become depressed mentally, thereby reducing his physical resistance and depraving his normal immunity, the sequela would automatically become manifest, and the psychopathic depression would become pathologic.

Another potent cause for the sequela of focal pathogenesis is a secondary infection which would sap the patient's resistance to the oral infection, and necessitate the formation of opsogens to combat the last infection, thereby overtaxing the antipathogenic properties of the body fluids.

Therefore, from a common-sense hypothesis, our moral and professional obligation to our patients is the immediate and complete eradication of foci of infection at the earliest possible moment. We therefore should make every effort toward becoming efficient in the diagnosis of all focal infection. It is the duty of every dentist to examine, not only the oral cavity and eliminate all oral foci of infection, but also to examine the tonsils of his patients suffering subacute infectious conditions, and advise them to consult the rhinologist when his services are necessary.

In turn, it is the physician's duty to examine the oral cavity and advise his patients to consult their dentists in every case, because ninety-eight per cent. of all patients, whether they are suffering any of the subacute diseases or not, have one or more focal infections, and the dentist should be and is more competent, on account of his special training, to diagnose diseases of the oral cavity than the general practitioner or even the specialist in any branch of the medical profession.

By animal inoculation Rosenow and other investigators have proven the selectivity of the organisms which we have isolated from oral foci of infection. Animals inoculated with germs from infected periapical tissues of patients, at post mortem examination show the germs to have been picked up in the heart, kidneys, liver, nerve trunks, joint tissues and general circulation.

A patient who reported for treatment at the Research Institute of the National Dental Association was suffering with an acute attack of myositis and toxic neuritis which produced chronic contractions of the muscles of the back of the neck, causing a retraction of the head. Radiographic diagnosis of the teeth demonstrated cryptic periapical infection of two teeth. The removal of these teeth and the curettage of the crypts permanently relieved the patient's symptoms. Anærobic inoculations of the curettage from these sockets grew streptococcus viridans. These germs were injected into the veins of seven rabbits and four guinea pigs. Within sixty hours all of the animals so inoculated developed the identical symptoms which the patient had suffered. After the death of some of the animals their spinal cords were evulsed, emulsified and cultures made. The identical streptococcal strain was demonstrated in these cultures. The trapezius muscles of their necks also were emulsified and cultures made of these tissues. Streptococcus viridans grew in the culture media from these inoculations.

A sane, logical, preventive medical hypostasis in all subacute infectious diseases, therefore, reverts to a positive diagnosis of focal infection and subsequently its complete removal, if possible, regardless of the cosmetic circumstances or even the immediate discomfort of the patient for no disease can be treated effectively until its cause has been removed.

AMALGAM, THE UN-ARISTOCRATIC*

BY C. W. MEGUIAR, D.D.S., FRANKLIN, KENTUCKY

WITH OTHER MEMBERS of this society I have been drafted on this occasion to present to you, briefly, the merits of a tooth-repairing material which had a rough voyage in its early career.

In the outset, I desire to declare my loyalty to the subject and obey the orders received, but don't understand me to advocate the employment of this material in any case where its defense is not established, or cannot be established, because at this day and time, that will invite attention toward me, rather than toward the subject.

The ups and downs of Royal Mineral Succidendum, now designated amalgam, remind me of my experience in a fast express train recently.

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*Read before the Kentucky State Dental Association, 1919.

The going was good, then, suddenly, it was rough, spiraling and loopety loopy, with sure destruction looming vividly in the terrific crash that followed. I still wonder at my deliverance. However, I am here, in new apparel, practically unscathed and on my way.

Amalgam has had a tortuous and corkscrew trip, but is here in new apparel and on its way—quite a way. Sledge hammer blows have been dealt it by iron-jawed, courageous men in efforts to send it to the junk heap. Influential men, leaders in our art, have scoffed and jeered at it, condemned it and denied it a place, or even recognition. Men who employed it were counted beneath the notice of certain eminent practitioners.

For a period its only noisy friend was the quack, who embraced it as a sheet anchor. He baptized and rechristened it "Silver," proclaiming it his own, and, in this, he found much profit and increasing notoriety.

Many conscientious workers noted its performance, made its intimate acquaintance and became adepts in its manipulation, and, at prices from one-half to one-fifth those of their scornful gold-worshipping competitors, actually saved teeth and had satisfied come-backs. While the one class decried, condemned and threw stones, the other kept the faith, got results and patiently labored on.

Popular demand, a great influence and persuader, intruded and tarried awhile. New alloys appeared from time to time, but slight gain was made toward improvement in quality. Then, according to the well ordered program of Destiny, the eternal cycle mill ground, and Black, the student, investigator and scientist, the man for the work, appeared.

How impressive becomes the thought when we reflect upon the promptness with which such characters always have appeared to meet a pressing demand of the hour! Think of the demands that summoned Fulton, Lincoln, Edison, Bell, Marconi, Wright, Maxim, Gorgas, Geothals and Foch to their work.

Upon the completion of Black's research and careful work Amalgam, modestly got up and went over the top into the thick of the fight; and it has steadily pushed forward until the gap is closed and its salient rests firmly against that of Gold, its principal ally in the struggle for permanent restoration.

In its cloudy days the quack found in it a friend and renamed it "silver," because he wanted to claim it. In its refinement and palmy days we have found in it a friend and, though we do not want to commercialize the name of its gifted refiner, I sometimes think we would honor and perpetuate his memory to simply call it Amalblack, or Amalgablack, with a capital A.

Authorities state that seventy-five per cent. of all the fillings made in teeth are of this material; therefore, to banish it now from the average dental practice is equivalent to taking an indefinite vacation.

The one great objection, its color, is also the chief objection to gold, its aristocratic ally. Were it composed of noble metals as rare as gold, its color would not offend; and it would obviously become the popular favorite. But, gold and yellow are as intimately associated as are gold and great value; hence, people of esthetic inclinations have little difficulty in compromising with the flashy color of this royal metal. Platinum and its metallic gray are associated just as closely and, no doubt, the same people would readily accept it as to color, being soothed and flattered by its distinguishing hue and knowledge of its great value. A well-made and well-kept amalgam filling is equally as sightly and far superior to one of platinum; and is equally as serviceable as one of gold. Thus, it appears that were amalgam as rare or as dear as either gold or platinum, it could occupy even the anterior teeth without prejudice.

You may think that a bold statement. Surely it is. My mission on this occasion is to laud the virtues and proclaim the possibilities of amalgam, proven by its record as a tooth saver. If you don't accept the statement, gentlemen, get up and unswallow your tongues and attack my position. I am representing the client and propose to claim all I believe to be true and reasonable. Unreservedly, I claim that if the intrinsic value of these two materials, gold and amalgam, were proportionately reversed, a decade would find gold as a tooth filler yielding steadily to amalgam, even in the anterior teeth. If you ridicule this statement I refer you to the sentimental craze for the costly platinum mountings of jewelry. How much better is the color of platinum than a high grade, polished amalgam?

You well know the great value of amalgam as a tooth preserver, but, in order that you may more fully comprehend and appreciate not only its worth, but also its actual advantage in permanency over any other filling material, the following facts should be noted: There is *no cavity or condition* of decay in the exposed surfaces of teeth in which a high grade amalgam filling will not secure as *permanent results* as gold or other material; there is no cavity or condition of decay in the exposed surfaces of teeth in which a gold or other filling material will exceed high grade amalgam in permanency; there are many cavities and conditions of decay in teeth *in which amalgam will exceed gold and other filling materials in permanency.*

For incisal edge, or angle, restoration only, the gold inlay is here excepted, because when properly made, fitted and anchored it is, in permanence and service, decidedly the peer of all known materials, including porcelain, which may chip and rarely matches the tooth shade very long.

There are members of this society present who recall the first Matrix Gold Inlay clinic of any record whatever, given by the essayist in Louisville in 1901, or 1902. I still have those three clinic gold inlays and prize them very highly, for their progeny is legion. Comes a time when they perhaps will occupy a pedestal midst dental archives and pioneer creations. The gold inlay in skillful hands is dependable, though not ideal for restoration because of its color. The same statement is true for amalgam, with the additional advantage of economy in time and expense.

Recall those badly-neglected cases in which no other material was indicated and you merely patched them up with amalgam until the inevitable day for extraction! Recall that upon return of some of them you took heart and did some real careful work in restoration, using again this once despised material to save a condemned vital organ!

It follows: That if these deductions regarding color tolerance, or color prejudice are true, then, we must give more attention to amalgam restoration and *charge as for gold,* or be content to employ this very valuable material out of sight until metallurgical chemistry evolves means to emancipate it from its unfair color environment.

ORAL HYGIENE IN CLEVELAND

BY E. L. PETTIBONE, D.D.S., CLEVELAND, OHIO

The Board of Education of City of Cleveland conducts six dental dispensaries within the public school buildings, each one being operated five half days (three hours) each week; an operator (dentist) is paid $5.00, and the assistant (a young woman of no technical training) is paid $1.50 per half day.

The public school physician examines all children's mouths at the time of the general physical examination; notices of defects and medical treatment are sent to the parents with information that if parents are unable to pay, the service can be had free at the dispensaries.

The school nurse must certify that the financial condition of the family is such as to warrant free service. Service rendered the children consists of relief from pain, prophylaxis, amalgam fillings, and extractions without anesthetic. Cases requiring an anesthetic or X-ray diagnosis are referred to the dental surgery which is conducted at the City Hospital.

The Cleveland Mouth Hygiene Association, one of sixty-seven participating agencies of the Cleveland Welfare Federation, maintains three dental dispensaries located in three of our seven health centers, which are under the Division of Health of City of Cleveland.

These dispensaries are operated five half days each week. In these dispensaries we care for the children attending parochial schools and certain adults, especially tuberculous people who are being allowed to remain in their own homes. In the health centers we charge fees from ten cents to fifty cents per operation, according to the patients ability to pay. Much of the work is entirely gratis. The public health nurse determines the financial rating of the patient.

6503 Detroit Avenue.

CORRESPONDENCE

Manaos, Brazil, July 13, 1919.
(Amazonas Prov.)

To the Editor of THE DENTAL SUMMARY:

I take great pleasure in bringing to your knowledge the fact that under date of July 8th, of this year there was formed and founded in this city of Manaos, an Association of Dental Surgeons; and under this there was elected the mentioned below as officials until June, 1920.

President, Pedro Telmo Barba; Vice-President, Octaviano Augusto Soriano de Mello; 1.º Secretary, Abner Barreira do Amaral; 2.º Secretary, Reynaldo Lopes de Albuquerque; Treasurer, Alexandre Carvalho Leal; Librarian, Manoel Rodrigues do Nascimento; Orator, João de Freitas.

I am taking advantage of this opportunity to offer to you our kindest regards and heartiest greetings.

Yours etc.,
(*Signed*) Associação Amazonense de Cirurgiões Dentistas,
1st Secretary, ABNER BARREIRA DO AMARAL.

Rua Jorge de Moraes 14, Manaos, Brazil.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS FRENCH-BELGIAN RELIEF FUND

We are glad to report the receipt of more contributions to the League fund for French and Belgian dentists who have suffered so severely from the war. As American dentists we should deem it a distinct privilege to give aid to our unfortunate brothers, for the benefits we enjoy are greater than those of any similar body of men in the whole world, and our income is far in excess of any previous time.

Let us not forget that to give is but to receive and the giver is the one who becomes greatly enriched thereby. Did you ever stop to question the ownership of the worldly goods in your possession? No doubt it would require much argument to convince you that you do not *own* the property in your possession—that the money you have earned by years of unremitting toil is given you to be held in trust for others. In a few years it must pass on to another link in the endless chain signified by birth and death, and will it not give you much satisfaction and comfort to know that you have transferred a due proportion of it to the welfare of your suffering brother dentists in devasted France and Belgium? There are about five hundred dentists, a good many widows and many children to be looked after. Will you not dig deep into your pockets and bring forth all you can possibly spare for this grand cause?

We earnestly urge all members of the League to rally to the cause and contribute at least one dollar each and thereby assist in making this object the success it merits. We have appointed a commission to represent the League, of Drs. Georges Villain, Wm. Slocum Davenport and Richard Burkhart, all of Paris. Following are letters recently received:

Dr. J. W. Beach, 131 Allen St., Buffalo, N. Y.

My dear Dr. Beach: It gives me great pleasure to act with Drs. Villain and Burkhart on the Commission to colaborate with the Aide Confraternelle, the acceptance of which I cabled you.

It is a great personal satisfaction to know the great interest the American Dental Profession takes in this most excellent work.

The Aide Confraternelle is composed of men who stand high in the Profession who have labored during the war under most trying conditions and are now most grateful for your assistance. I might mention Dr. I. B. Davenport, my brother, is Vice-President of the Aide and was one of the Founders. Your Committee has had two meetings with the Aide and will be kept in constant touch with all of its proceedings.

As I cabled you "Funds Urgent" with the present exchange 8.665 every dollar will count. A few weeks ago the exchange was 9.13, but no doubt that side of the question will be carefully watched by you in America.

The conditions in Paris have much improved in many ways. The French dental profession has made a fine showing in Army and Hospital work and we anticipate a better recognition for them in the near future, on the line we have attained in America.

My dear President, it is a privilege to be called upon to work with you, in the interest of our French Confreres who have always shown Americans every courtesy.

Ever fraternally yours,

WM. SLOCUM DAVENPORT.

(Extract from letter received from Dr. Richard Burkhart, of Paris)

As Dr. Davenport writes and cabled they, Aide Confraternelle, do need money. They have now about seventeen children they are looking after and several widows, as well as receiving requests for help from many dentists. They are about as representative and active a group of French dentists as can be gotten together, are very fine men and deserving of a great deal of credit for the work they have done and are trying to do.

They give money to buy equipment to any deserving dentist or help the family of any. Sometimes they give two or three thousand francs or more but usually less. They have helped some Belgians and as far as I can see are not at all partisan but willing to help all.

With the exchange as it now stands we can do a bigger thing by getting any available money as soon as possible.

They are planning to try and make dentists of all of the children they can which surely is a good thing. They bring up each name at the meeting and investigate it and no money is given until voted on. If you want us personally to see each applicant or go into the matter more, let me know.

Kindly send all contributions to Dr. L. M. Waugh, 576 Fifth Avenue, New York, N. Y., who is treasurer and will acknowledge all receipts and render a strict accounting of all disbursements.

J. W. BEACH, *President.*

EDITORIAL

THE OHIO STATE DENTAL SOCIETY

The "Victory Meeting" of the Ohio State Dental Society, held in Columbus, December 2, 3, 4, 1919, was one of the best the society has yet held. The attendance, including members, visitors and exhibitors numbered many more than twelve hundred, and the arrangement for meetings, clinics and exhibits was ideal. The essays, illustrated lectures and clinics were interesting and instructive. They will all be published in THE DENTAL SUMMARY.

The Victory Banquet, Wednesday evening, given in honor of Col. W. H. G. Logan and the members of the Ohio State Dental Society who were in the service, was the best attended of any banquet given by the society. The speeches were interesting, entertaining and filled with words of praise for the faithful and superior service performed by the dental corps in the Army and Navy.

The dealer's exhibits were the "best ever."

In the business sessions of the society, the sum of one thousand dollars was appropriated for the J. R. Callahan memorial fund. Five hundred dollars was authorized as a drawing account for the Oral Hygiene committee, during 1920.

A committee consisting of Drs. H. C. Brown, G. Hayden, H. M. Semans, E. L. Pettibone, L. L. Barber and H. J. Vollmayer, was selected to confer with the Joint Legislative Committee (of the Legislature) on Administrative Reorganization, regarding important legislation to come before the legislature this winter. The proposed legislation has to do with changes in the dental law, dental service in public schools and state institutions, the dental hygienist, the dental board, etc.

The Hughes Health Legislation was commended. A committee named to accept applications for membership in Inter-Professional Conference, comprises Drs. Gillette Hayden, J. F. Stephan, S. J. Rauh, and L. L. Barber.

Amendments to Constitution and By-laws; abolishing the office of Second Vice-President; adding to standing Committees, Ad Interim committee of Board of Directors, legislation and components, and dropping Committee on Military Dentistry. Making President-elect Chairman of Committee on Components, together with the President of each Component. Making the Vice-President Chairman of the Membership Committee, with the Treasurer of each Component. Combining the Committee on Infraction of the Code of Ethics with the Board of Censors, under latter title. Adding Chairmen of Program Committee and Arrangement Committee to the Board of Directors, *ex-officio*.

Drs. Logan and Conzett were made Honorary members of the society.

The Constitution and By-Laws will be published, and a copy placed in the hands of each member before the next annual session.

Officers for 1920 were elected as follows: President, Chas. W. Mills; President-elect, H. M. Semans; Vice-President, C. H. Schott; Secretary, F. R. Chapman; Treasurer, A. O. Ross.

Director, three years, L. L. Barber.

Delegates to National Dental Association for two years, C. W. Mills, T. I. Way, W. A. Price, Harry Cope; for one year (to fill unexpired term), F. M. Casto. Alternates, for two years, J. K. Douglas, J. J. Welker, F. M. Pursell, C. H. Schott.

The next meeting of the society will be held in Columbus, December 7, 8, 9, 1920.

THE DENTAL HYGIENIST

There are few people today who would deny that a clean mouth contributes to the health of any human being. Acknowledging the desirability of a clean mouth (mouth hygiene) let us consider how we are to secure the necessary skilled service to establish clean mouths for all children.

The primary function of a dental hygienist is to remove calcareous deposits, accretions and stains from the exposed surfaces of the teeth of children.

The first requisite for a dental hygienist is a well-trained, alert mind, with high ideals of service to humanity as the aim of life, in a clean sound body.

The second requirement is the proper professional training followed by an examination by an impartial body such as the State Board of Dental Examiners.

The professional training (knowledge and skill) necessary for an individual to possess to be qualified to properly and safely render a child's mouth clean would comprise a limited knowledge of the anatomy and physiology of the mouth, together with a certain general, and some special understanding of pathology. To this must be added training, adequate both in quantity and quality in the mechanics of instrumentation.

The practice of dental hygiene should be under the immediate supervision and observation of a dentist who is more than usually trained in pathology and diagnosis, and possesses an abundance of the growing spirit of service to humanity.

The service of dental hygiene is well suited to the qualifications of a woman, and we believe the rendering of this service should be limited to women.

Before we can enjoy the services of dental hygienists we must accomplish two things, namely, enact suitable legislation for the licensing of hygienists, and secondly, establish schools for their training. A considerable number of states already enjoy the advantages of dental hygienists, and Ohio should give immediate attention to this matter.

The chief objection offered is that the dental hygienist will attempt to practice dentistry and thus inflict an injury upon the public. This would be most unfortunate, but we have no more reason to fear it than that the nurse will assume to practice medicine. The states where dental hygienists have been most employed report no abuse of their privileges. There is another consideration: We need every available dentist to perform operations upon sensitive living tooth structure. Women who devote one or two years to intensive training for this service (dental hygiene) will be able to render a most valuable aid in the great "better health movement" which is sweeping this country and furthermore they will be able to render this service for a just compensation much less than it would be necessary to pay dentists who have been training for four years to perform many other operations requiring a far more profound knowledge of the fundamental medical sciences.

—*H. R. C. W.*

ANNOUNCEMENT

This is to announce the appointment of Rea P. McGee, M.D., D.D.S., as Editor of *Oral Hygiene*, succeeding the late Dr. William W. Belcher.

Dr. McGee, prior to service in the army, practiced dentistry in Denver, but in order that he may be in daily touch with this work, it is his intention to establish himself in Pittsburgh.

That he is particularly well qualified to fulfill the duties of this position is well known to every one familiar with his literary ability and his work both in this country and on the battlefields of France.

He is a trained newspaper man, having been a member of that profession before studying dentistry and medicine, and there is no question but that his personal charm, coupled with his ability to express himself clearly and forcefully, will be reflected in the magazine.

W. L. SMITH, *Publisher.*

The dental hygienists of Colorado are licensed to remove deposits, tartar, accretions and stains from the exposed surfaces of the human teeth in public schools and other public institutions, in charitable institutions, and in the offices of registered dentists, but only under the supervision of a duly licensed dentist.—*Dominion Dental Journal.*

The addition of a small amount of common table salt to carbolic acid will materially increase the efficiency of its action.—*Oral Hygiene.*

SUGGESTIONS

CONDUCTED BY F. R. CHAPMAN, M.S., D.D.S., COLUMBUS, OHIO

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

Mending Broken Plaster Casts

This office challenges any dentist to produce a better cast cement than the one suggested several years ago by Dr. V. Clyde Smedley of Denver. It is made of:

Acetone—quantity determined by quantity of cement you desire.

Celluloid—enough to thicken the acetone to the consistency of a liquid cement. (The tendency is to make the cement too thick).

The acetone may be obtained at any drug store and the celluloid from a number of sources. The following articles will yield a supply:

First, auto curtains.

Second, kodak films (from which the gelatin coating has been boiled).

Third, celluloid blanks or old celluloid dentures.

Fourth, imitation ivory combs (ten cent store).

It is perfectly obvious that articles from *third* and *fourth* sources on account of thickness will require a longer time to dissolve. Use a wide-mouth bottle provided with a thin wooden spatula pushed into the stopper end of the cork. The spatula is better than a brush and always is ready for business.—*Dayton D. Campbell.*

Potassium Sulphate vs. Salt

Potassium Sulphate is so far superior to sodium chloride as an accelerator for plaster and its compounds, that, once the dentist has used potassium sulphate for this purpose, salt goes into the dental discard. It is somewhat more expensive but the cast or impression is rendered so much harder through its use that the insurance against breakage is paid for in the added expense. Use the same as salt, or a better and cleaner way is to keep a saturated solution in a toilet water bottle and throw in a "dash" or two just before adding the plaster. Add alternately from time to time water and potassium sulphate until you note by the excess in the bottom of the bottle that you have a saturated solution.—*Dayton D. Campbell.*

Stoppers for Varnish Bottles

There are bottles made and sold as containers for alcoholic solutions of resinous substances. These bottles are designed with wide mouth, automatically ground lip and an over-lapping marginal stopper—the idea evidently being that after the dentist has once used his shellac, sandarac or "fiddle-bow" varnish he will be enabled on the morrow, or possibly as much as a week later, again to open this vial thing and again brush up on his impression. At the risk of making this hint too long, we suggest that, *if* the dentist is of the scented, mote-picking, systematic, cause and effect variety, that carefully removes the surplus before the bottle is closed, the bottle will open when the mystic words are uttered.

We who are not of this elect, much admired and oft emulated group are advised to secure a Lavoris bottle and provide our ten or twelve-inch wooden handle paint brushes with beeswax corks. If unstained handles are obtained the liquid will not become colored, and in making the corks by pouring the melted wax from the spatula and molding it around the handle until the stopper is of the right size, the unstained handle will absorb some of the wax, thus making it adhere more tenaciously to the handle.

Before the solution is poured into the bottle, the lip and inner throat should be swabbed with heavy vaseline. The brush should be treated in like manner from the bristles up to and including the inner surface of the beeswax stopper.—*Dayton D. Campbell.*

Correcting the Articulation

A very good plan for testing the articulation is to mix rouge and oil and paint this onto the occlusal surfaces. When thus painted, let the patient move his mandible about as in masticating, and the rouge and oil will mark the points that interfere and these may be ground away with small carborundum stones. This rouge paste will even serve better than carbon paper in many instances, especially in crowns where the polish of the gold or porcelain is very high.—"Around the Table," *Dental Items of Interest.*

A very easy and good method for locating the high points in a faulty articulation or on porcelain teeth that do not take the carbon stain from the articulation paper, is the use of a rather soft and sticky black wax. This wax is manufactured for the boxing of impressions in denture work. Coat the occlusal surfaces with a thin layer of this wax, then spread it evenly by passing a blast of hot air over it, or in case of a denture, pass the teeth over the alcohol flame. Allow the patient to masticate on this coating of wax as they would on food. The high spots that will show through this black wax easily can be seen and then reduced by grinding with small carborundum stones. Remelt this same wax and repeat the operation as often as necessary to get the desired articulation.

—*F. W. F., Pacific Dental Gazette.*

The Articulator

All cases of bridge work, especially those involving the posterior teeth, should be constructed upon casts that have been extended far enough to obtain a balanced articulation and then mounted upon an *articulator*, and not upon one of those small hinge affairs frequently called crown and bridge articulators. This latter class of appliance do not afford lateral movements. Many of the failures in this work can be directly attributed to faulty articulation due to incorrect mounting of poor casts upon pseudo-articulators.

--*F. W. F., "Pacific Dental Gazette."*

Removal of Rust from Steel Instruments

To remove rust from steel instruments, Sangu recommends placing them over night in a saturated solution of zinc chlorid. The rust disappears through reduction. On removing the instruments they are to be rinsed in clear water, placed in hot soda and soap solution, and dried. It is also advantageous to polish with absolute alcohol and chalk.

—*Pacific Medical Journal,* per *Dental Surgeon.*

Plate Polishing

Metal plates will take on a very high luster when a little aqua ammonia is used in mixing the chalk instead of water. Vulcanite will take on a mirror polish if the finishing is done by the use of tin oxid made into a paste with glycerin. In either case a clean buff should be chosen, and kept exclusively for this purpose.—*Dental Record.*

The Dental Hygienist

Miss Evangeline Taintor, Forsyth Dental Infirmary Training School, 1918, read an interesting paper on her experiences as dental hygienist in the office of the Surgeon-general, Washington, D. C. It was gratifying to note that training received in the Forsyth surgical department had been of great service. As might be expected, those dental hygienists who were already familiar with oral surgery could take hold and do efficient work in this line, in addition to their other duties. The thoroughness and efficiency of the dental hygienists' prophylactic cleaning caused much favorable comment. Dental hygienists may well feel encouraged at the ever-increasing appreciation of their work. The United States Government has now shown still further recognition of their worth by establishing a civil service examination through which appointments may be obtained. We may justly expect that the dental hygienist, like the trained medical nurse, will in time be employed in every field where efforts are made to maintain and establish good health.

—*Dental Cosmos.*

Preparation of the Tooth for a Jacket Crown

In preparing a tooth for jacketing the first step is to shorten the tooth about one to two millimeters, then with thin carborundum disks the mesial and distal sides are trimmed down to the gingiva, where a slight shoulder or inset is formed. The shoulder should be at right angles to the long axis of the tooth, then the labial or buccal side, as the case may be, is stripped of enamel, and a shoulder formed just under the free margin of the gingiva; then the lingual side is ground, care being taken to observe the bite, and allow sufficient room for the porcelain body. After the four sides are ground in this manner, the shoulder is sharply defined with finely-cut fissure burs, end-cutting burs, and small mounted stones; also with enamel chisels the shoulder is smoothed. When finished the shoulder should be just far enough under the free margin of the gum to make the joint invisible, care being taken to prevent injury to the peridental membrane, which is usually the case when the root is ground far under the gums to hide the cast joint of a pivot crown, the gum being thereby subjected to undue irritation. When properly jacketed the gum tissue will be pink and healthy in appearance, and the peridental membrane will not be injured. The greatest circumference of the tooth must be at the shoulder, and care must be taken that there are no undercuts to prevent the accurate withdrawal of the impression; the smallest shoulder that can be trimmed is sufficient. If there are any undercuts present they may be filled with cement or gold inlay according to the case, before attempting any impression. After the tooth is properly prepared, a copper or aluminum band is trimmed to fit the tooth snugly under the gingiva. The band should fit one millimeter beyond the shoulder. The band is then filled with modeling compound, heated, and forced to place, is chilled and withdrawn; then the margin of the impression is heated over the lamp flame and forced again to place. The cool compound will then swage the warm compound around the shoulder, and a sharp accurate impression will be the result. Next a mush bite of pink paraffin and wax is taken. The tooth is then dried throughly, and a coating of varnish is applied. Varnish is made by dissolving rosin in chloroform. The varnish protects the tooth, and prevents absorption of any of the secretions, also prevents any irritation of the pulp from the cement. The tooth is then covered with a gutta-percha crown, which keeps the gingiva packed from the shoulder, and protects the tooth until the jacket crown is finished and cemented. The color is selected and the patient dismissed. A cement reproduction of the tooth to be jacketed is made from a modeling-compound impression of the tooth. This is tapered to simulate a root, which also makes it possible to remove it from the plaster cast. Next the cement root should be treated with olive oil or vaseline, and placed in the wax bite. Then the model is poured. Upon separating the model the cement root easily may be removed, and the crown can be made on the cast in the absence of the patient.

—*Hugh Avery, Journal California State Dental Association.*

OBITUARY

Dr. William Wellington Belcher

DR. WILLIAM W. BELCHER

As briefly announced in our December issue, Dr. William W. Belcher, one of the best-known and widely-respected dentists in America, died Thursday morning, December 4, 1919, aged 53, after an acute illness of four days.

Dr. Belcher was born at New Milford, Pennsylvania, August 27, 1866, the son of John W. and Lois Belcher, of old Pennsylvania families.

He received his first training in Washington, paying his own way by working in the private laboratories of local practitioners. Later he entered the Philadelphia Dental College and Garretson Hospital of Oral Surgery, graduating in 1889.

Following one year in Rochester with Dr. J. Edw. Line, he practiced for six years in Seneca Falls, N. Y., returning to Rochester to become associated with Dr. Henry S. Miller. Within a year of this relationship he opened an office of his own, continuing in practice until the beginning of the illness that terminated in his death.

From 1910 to 1913 inclusive, he edited the *Rochester Dental Dispensary Record*, a bi-monthly supported by the Rochester Dental Society, and largely instrumental in interesting the public-spirited citizens of Rochester, and later the municipality itself, in free dental dispensaries for the children of the city's worthy poor. It was the success of this movement and the interest it aroused that resulted in the great institution founded by Mr. George Eastman.

In May, Dr. Belcher was dangerously ill from acute Bright's disease. He recovered sufficiently to go out and it was thought that he would regain good health, until the Saturday evening prior to his death, when he was seized with a stroke of paralysis at the dinner table. Two physicians were summoned and administered treatment, but he went into a comatose condition from which he never rallied.

Five years ago he became editor of *Oral Hygiene* and through its pages has made the dental dispensary idea common property throughout the English speaking world.

In the November number of the magazine, of which he was editor, Dr. Belcher had an article entitled, "The Free Dispensaries of the Rochester Dental Society." In this he reviews the history of free dispensaries in that city from one at the General Hospital, which only lasted two years, to the present dispensary in Main street, east.

It would not be known from this how great a part he had in establishing free clinics for poor children when the movement had nothing like the support it has today. It has been said that because of his devotion to this work he brought on the condition which invited death.

Dr. Belcher was one of the first dentists to use porcelain teeth when they were almost unknown. He investigated their use and spent much time in his laboratory.

He was a member of the Rochester Dental Society, the Seventh District, the New York State Society and the National Association.

The funeral ceremonies were held on December 6th, and the interment made in the family plot in the cemetery at Auburn. A delegation of dentists of Auburn met the remains at the depot, six of them officiating as active pallbearers.

Dr. Belcher leaves his wife, Mrs. Alice E. Crossman Belcher; one son, Harold W. Belcher, of Detroit; a daughter-in-law, Mrs. Jane Wright Belcher; his father John W. Belcher, of Bath; a brother, Harry L. Belcher, of Seneca Falls, and two sisters, Mrs. Grace W. Scott and Mrs. Freda B. Huebner, of Toledo.

Dr. J. E. Phelps

At Chagrin Falls, November 25, Dr. J. E. Phelps, in his seventy-fifth year, and the fifty-fourth of his activity as a practitioner of dentistry.

Dr. Phelps was born at Pittsfield, Mass., February 16, 1844; came west to Chagrin Falls in 1863, and began the practice of his profession there in 1865, continuing in active work until a few weeks prior to his passing away.

To know who and what a man is, ask his neighbors. Therefore, in telling the world of Dr. Phelps, we can do no better than to quote from the *Chagrin Falls Exponent*, published in his own town by men who knew him well. In its issue of December 4, that paper says:

"In the passing of Dr. Phelps, we have lost one of our leading and most public-spirited men, one always deeply interested in everything that tended to promote the public welfare, especially the welfare of the young. No other man in the village took the interest in children that Dr. Phelps did. His many kindnesses and words of cheer long will be remembered by our young folks. Many boys and young men have cause to remember his friendly counsel, given in a way that could give no offense. His quiet, unassuming friendly spirit was his conspicuous quality. Thousands in this and neighboring counties will remember him for his courtesy, his kindly ways and the tact with which he approached difficult cases needing wisely-proffered aid.

"Dr. Phelps was greatly interested in his profession, always keeping abreast of all real advancement, particularly that which had to do with the teeth of the young, always ready and eager to 'do a little missionary work,' as he expressed it, from which there could be no return except the satisfaction that follows duty well done.

"The record left by Dr. Phelps stands out alone and exceptional among all those who have been born and who have died in Chagrin Falls, and he was truly its Grand Old Man."

Dr. Phelps was the father of one son, and five daughters, and the perceptor of Dr. L. T. Canfield, of Toledo, who lived in his family for many years.

THE great highroad of human welfare lies along the old highway of steadfast well-doing; and they who are the most persistent, and work in the truest spirit, will invariably be the most successful; success treads on the heels of every right effort.—*S. Smiles.*

SOCIETY·ANNOUNCEMENTS

Ohio Medical University Class of 1899

On April 18, 1899, there passed through the doors of the Ohio Medical University (now part of the Ohio State University) a class of twenty-nine young men carrying diplomas which gave them the Degree of Doctor of Dental Surgery, and entitled them to practice dentistry. In the twenty years that have passed two of these young men have been called to their home above. The remaining are found in seven different states of the Union.

On Wednesday, December 3, 1919, at Columbus during the time of the meeting of the Ohio State Dental Society, thirteen of these young men again gathered together in class formation and had luncheon together.

A permanent organization was formed with Dr. Daniel L. Rankin as president and Dr. John H. Bristor, secretary-treasurer, and will meet for luncheon and reunion the second day of the state society meeting, each year.

Those of the class present were: Drs. Daniel L. Rankin, Cambridge; Harry McLaughlin, Jamestown, Pa.; Howard S. Barrick and Judson T. Lewis, Newark; R. B. Cochrane, and Lieut.-Col. George P. Gunckel, Columbus; Frank G. Jackson, Bellville; W. B. Horton, St. Marys; Walter E. Jackson, Dayton; E. L. Murphy, Corning; J. A. Rockey and J. C. Strover, Lancaster; John H. Bristor, Mansfield. Dr. A. O. Ross, Columbus (the first dean of the class) was the honor guest. Other guests were Dr. G. W. Bourne, of Newark, who started with the class but was unable to complete his course, and Mrs. J. A. Rockey.

Dr. F. R. Chapman (demonstrator in operative dentistry the three years the class was in college) and Dr. A. O. Ross were elected honorary members.

The addresses of the following are unknown and anyone knowing them will confer a favor by notifying the secretary of the class: H. D. Thomas Frank P. Haverfield, J. W. Dixon, J. A. Douglass, R. F. Leslie and G. H. McFarland.

Drs. E. W. Iden, Cleveland; A. O. McLaughlin, Cortland; L. H. Black, Youngstown; Harry M. McDonald, Bay Side, Long Island, N. Y.; V. I. Miller, Shreveport, La. sent regrets for not being able to be present.

JOHN H. BRISTOR, *Secretary.*
Mansfield, Ohio.

Change of Dates

The Fifty-sixth Annual Meeting of the Illinois State Dental Society, will be held in Chicago, beginning Monday, March 22, 1920, and continuing for four days. Headquarters will be at the Congress Hotel, where Sessions, Clinics and Exhibits will be housed.

Kentucky State Dental Association

The next annual meeting of the Kentucky State Dental Association will be held in Louisville, April 7th, 8th and 9th, 1920. A program of unusual interest has been planned. Address all correspondence to

W. M. RANDALL, *Secretary*, Louisville, Ky.

St. Louis Study Club—Simi-Annual Clinic

The semi-annual clinic of the St. Louis Study Club will be held at Hotel Jefferson, the afternoon of January 10th. The following Fall courses will have been completed at that time: Porcelain Technic, Dr. J. D. White; Vital Abutment and Porcelain Root Bridges, Dr. E. R. Hart; Crown and Bridge Technic, Dr. Otto J. Fruth and Dr. Malcolm Robb; Radiodontia, Dr. C. O. Simpson; Pulp Canal Technic, Dr. W. A. Chamberlain; Conductive and Infiltration Anesthesia, Dr. E. C. Engel; Full Denture Technic, Dr. E. B. Owen; Oral Pathology, Dr. Virgil Loeb; Bacteriology, Dr. B. J. McMahon.

The clinical program will consist of group clinics by each of the classes to demonstrate the methods and technic taught, and individual clinics in which all ethical members of the profession are invited to participate. An informal dinner will follow the clinic, at which the organization of other classes will be effected. Detailed information concerning the clinic and study courses may be obtained from Dr. F. C. Rodgers, Wall Building, St. Louis.

CLARENCE O. SIMPSON, *Chairman Publicity.*

Montana State Board

The Montana State Board of Dental Examiners will hold regular examinations at Helena, Montana, January 12, 1920. Applications should be in the hands of the Secretary at least ten days before he examinations.

Helena, Mont., Nov. 8, 1919 T. M. HAMPTON, D.D.S., *Sec'y.*
Helena, Montana.

By mixing whiting to a paste with vinegar instead of water (for polishing), a far better and easier polish to vulcanite may be obtained.

—*A. A. McMaugh, Commonwealth Dental Review.*

OHIO STATE SOCIETY

Members of the Ohio State Dental Society ho have not yet paid their dues for 1920, should do so immediately in order to receive the Summary and the *Journal of the National Dental Association* from the first of the year.

Members of the Society who were in service during the war, and whose names do not appear in the program, are requested to report the fact, with respective rank, to the secretary of the State Society.

Any such members who were not present at the recent meeting of the State Society may secure one of the souvenir badges by addressing the secretary.

Committees for 1920

Ad Interim Committee of the Board

C. W. Mills H. M. Semans C. H. Schott
F. R. Chapman A. O. Ross Harry Cope
E. C. Mills L. P. Bethel F. M. Casto

Publication

F. R. Chapman, *Chairman*
305 Schultz Bldg., Columbus
L. P. Bethel, Editor W. G. Hamm

Program

L. P. Bethel, *Chairman*,
185 E. State St., Columbus
W. H. Whistlar H. E. Germann

Clinic

F. M. Casto, *Chairman*
458 Rose Bldg., Cleveland
L. E. Custer T. I. Way D. P. Snyder

Board of Censors

J. F. Stephan, *Chairman*
1402 Guardian Bldg., Cleveland
G. H. Williamson E. E. Hall

Committee on Arrangements

Harry Cope, *Chairman*
328 E. State St., Columbus
J. R. Kelly C. W. Strosnider

Hygiene

E. L. Pettibone, *Chairman*
6503 Detroit Ave., Cleveland
E. W. Martindale C. E. Smith
E. S. Braithwaite H. M. Brewer

Dental Legislation

H. C. Brown, *Chairman*
609 Hartman Bldg., Columbus
L. L. Barber W. H. Hayden

Committee on Components

H. M. Semans, *Chairman*
College of Dentistry, O. S. U., Columbus
And the President of each Component Society

Membership

C. H. Schott, *Chairman*
511 Neave Bldg., Cincinnati
And the Treasurer of each Component Society

History

C. I. Keely, *Chairman*
Hamilton, Ohio
G. D. Edgar F. M. Pursell

Library

E. C. Mills, *Chairman*
151 E. Broad St., Columbus
H. T. Smith C. H. Martin

The Component Societies of the Ohio State Dental Society

(This list of Officers is compiled from information furnished by the Secretaries of the various Components; where incorrect it is due to lack of information relative to elections. Secretaries are requested to keep the list correct by notifying the secretary of the State Society or the Editor of The Dental Summary of the result of elections.)

1 Maumee Valley Dental Society, meets 2d Tuesday, June and Oct.—Pres., A. B. Thompson, Metamora; V. Pres., N. A. Cunningham; Rec. Sec., O. S. Applegate; Cor. Sec., H. M. Jordan, Hicksville; Treas., J. A. Benner.

2 Toledo Dental Society, meets 3d Friday. Pres., T. S. Shaw; V. Pres., H. W. Hisey; Sec., L. C. Jackson, 2205 Ashland Ave.. Treas., C. H. Cox.

3 Wood County Dental Society, meets 2d Wednesday.—Pres., F. W. Wemmer, North Baltimore; V. Pres., B. D. Roe; Sec., R. E. Milbourn, North Baltimore; Treas., T. M. Lea.

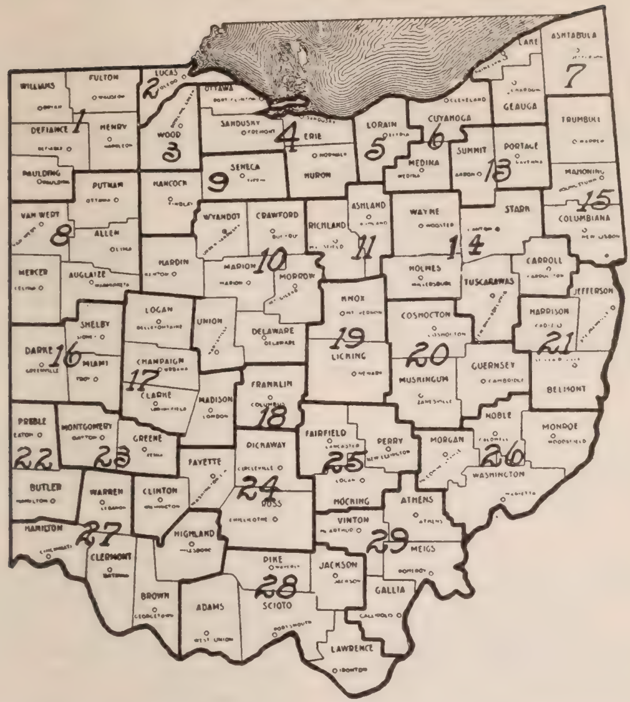
4 North Central Ohio Dental Society, meets 3d Wednesday, Jan. Apr., July and Oct.—Pres., R. E. Woleslagel, Bellevue; V. Pres , A. G. Thatcher, Fremont; Rec. Sec , L. H. McDonald, Norwalk; Cor. Sec., S. H. Rogers, Sandusky; Treas., E.S. Braithwaite, Willard.

5 Lorain County Dental Society, meets 1st Tuesday, Feb., Apr., Sep. and Nov.—Pres., W. G. Schaeffer, Amherst; V. Pres., J. A. Minnich; Rec. Sec., P. E. Maddock; Cor. Sec. J. E. Betteredge, Elyria; Treas., J. E. Trombley.

6 Cleveland Dental Society, meets 1st Monday, Pres., I. M. Saum; V. Pres., J. A. Loughry; Rec. Sec., S. F. M. Hirsch; Cor. Sec., F. M. Casto, 458 Rose Bldg.; Treas., E. D. Phillips.

7 Northeastern Ohio Dental Society, meets 2d Monday —Pres., N. H. Bishop, Andover; V. Pres., H. O. Frederick; Sec., O. T. Battles, Jefferson; Treas., O. T. Battles.

8 Northwestern Dental Society, meets 4th Wednesday.—Pres., A. Jones, Lima; Vice Pres'ts., J. R Cannon and I. W. Wright; Sec. J. W. Dimond Lima; Treas., J. K. Bannister.



9 **Hancock - Seneca Counties Dental Society**, meets 2d Wednesday.—Pres., T. C. Schwartsbek, Findlay; V. Pres., A. O. Cole; Rec. Sec., E. V. Burns; Cor. Sec., A E. Mann, Findlay; Treas., V. H. Michener.

10 **Central Ohio Dental Society**, meets 1st Wed., Feb., May and Oct.—Pres., O. M. Young, Marion; Vice-Presidents, Frank Burger and F. P. Leonard; Rec. Sec. D. G. Welch; Cor. Sec., F. R. Mann, Marion; Treas., F. C. McGaughy.

11 **Richland-Ashland Counties Dental Society**, Meets last Monday, Feb., June and Oct.—Pres., J. F. Winans, Shelby; V. Pres., B. W. Livingston; Rec. Sec., F. O. Eckstein; Cor. Sec., J. H. Bristor; Treas., F. H. Williams, Shelby.

12 **Stark County Dental Society**, meets 3d Wednesday—Pres., C. O. Carr, Massillon; V. Pres'ts., B. H. Bowman and J. G. Foltz; Rec. Sec., C. A. Allensworth; Cor. Sec., F. M. Lose, Massillon; Treas., F. M. Lose.

13 **Summit County Dental Society**, meets 1st Friday. Pres., W. C. Cooper; V. Pres., Jas. Conners; Rec. Sec., H. G' Haas; Cor. Sec., G. H. Dumm, Kent; Treas., C. S. Hoover.

15 **Corydon Palmer Dental Society**, meets 2d Thursday, April and Oct.—Pres., J. F. Steele, Lisbon; V. Presidents, T. J. Evans, J. H. Chessrown and G. L. Moore; Rec. Sec., J. T. Williamson; Cor. Sec., W. B. Challis, Lisbon; Treas., J. K. Nash.

16 **Western Ohio Dental Society**, meets 1st Thursday, Feb., May and Oct.—Pres., A. A. Davis, Troy V. Prests,, P. G. Eddy, J. J. Little and V. E. Bedford; Sec'y-Treas., F. A. McCullough, Troy.

17 **Mad River Valley Dental Society**, meets 2d Monday, bi-monthly.—Pres., E. Dibert, Springfield; Vice Presidents., A. E. Bible and H. Houser; Rec. Sec., H. H. Krapp; Cor. Sec. W. B. Seward; Treas., E. V. M. Thompson.

18 **Columbus Dental Society**, meets last Tuesday, Pres., D. P. Snyder; V. Pres., F. L. Gruber; Rec. Sec., E. N. Hoopman; Cor. Sec., F. C. Starr; Treas., A. O. Ross.

19 **W. D. Miller Dental Society**, meets 2d Thursday. May and Oct.—Pres., W. S. Deely. Mt. Vernon; V. Pres,, H. S. Barrick; Rec. Sec., L. E. Davis; Cor. Sec., E. V. Prior, Newark; Treas., W. B. Grossman.

20 **Muskingum - Coshocton - Guernsey Counties Dental Society**, meets 2d Thursday, Jan., May and Sept.—Pres., W. H. Dillon, Zanesville; V. Pres., P. F. Walker and A. W. Boyd; Rec. Sec., J. A. Honabarger; Cor. Sec., B. M. Beatty, Zanesville; Treas., H. J. Boyd.

21 **Eastern Ohio Dental Society**, meets 1st Thursday, May and October—Pres., C. S. Starkweather, Bellaire; First V. Pres, L. B. Peterson, Steubenville; Second V. Pres., George Sharp, Flushing; Cor. Sec., J. K. Hunter, Bridgeport; Rec. Sec., H. A. Smith, Steubenville; Treas., S. C. Hasbronck, Barnesville.

22 **Butler County Dental Society**, meets 3d Friday. each month.—Pres., P. A. Krucker, Hamilton, V. Pres., E. E. Meisterhaus; Sec.-Treas., F. T. Craven, Hamilton.

23 **Miami Valley Dental Society**, meets last Monday. Pres., H. C. Huffman; V. Pres., H. L. Oliver; Cor. Sec., H. M. Brewer; Rec. Sec., W. B. MacBain; Treas., J. R. Arthur; J. M. Chase; representative to the State Dental Society.

24 **Rehwinkel Dental Society**, meets 3d Thursday. Pres., A. M. Bush; V. Pres., O. A. Thompson; V. Pres., C. H. Martin; Sec., F. D. Wollard, Washington, C. H.; Treas., C. V. Lanum.

25 **Hocking Valley Dental Society**, meets 1st Monday.—Pres., J. J. Stukey; Vice Pres'ts., C. F. Ackers and W. M. Scott; Sec., R. H. Wetzel, Lancaster; Treas., D. P. Vosper.

26 **Southeastern Ohio Dental Society**, no report

27 **Cincinnati Dental Society**, meets 3d Friday. Pres., R. W. Taylor; V. Pres., W. Foster; Rec. Sec., P. Cassidy; Cor. Sec., C. H. Stricker; Treas., J. D. Gordon.

28 **Southern Ohio Dental Society**, meets, 3d Monday, May and Oct.—Pres., O. D. Donaldson, Portsmouth; V. Pres., F. C. Goodwin; Sec., E. C. Jackson, Portsmouth; Treas., E. O. Buchanan.

29 **Ohio Valley Dental Society**, meets 2d Wednesday, Apr and Oct —Pres. M. D. Hartinger, Pomeroy; V. Pres., R. B. Church; Sec., C. S. Shumaker, Pomeroy; Treas., J. B. Hodge, Middleport.

30 **Tuscarawas County Dental Society** (a new society) meets 2d Tuesday. Pres. A. W. Davis, Dover; V. Pres., F. H. Waldron; Sec. and Treas., E. S. Wagner, Dover.

An Appeal to Dentists for Cooperation in the Fight Against Venereal Diseases.

The war turned the spotlight on many things heretofore neglected or avoided. No disclosures were more startling than those showing the destructive inroads of venereal disease on the health and efficiency of the Army and Navy.

From the time the United States entered the war in April, 1917, to September, 1918, the loss to the Army from venereal disease represented 2,295,000 days of service.

Now this war is over!

The Nation is on its way to a peace basis.

Interest begins to turn from the fighting efficiency of the Army to the reconstructive power of industry; and as it turns this striking fact stands out: *All venereal diseases in the Army were caused by conditions in civilian life. The Army and Navy, as organizations, do not tolerate prostitution.*

TESTIMONY OF THE ARMY

Immediately following the declaration of war the Army Medical Department organized to cope with venereal disease, and one of the first points emphasized by its Surgeon General was that each individual case must be treated under competent medical supervision until cured. He laid special emphasis on two points:

1. The ineffectiveness of self-treatment by the use of simple or patent remedies.
2. The danger of quack doctors, who advertise to treat so-called private diseases.

Nineteen months of war have shown conclusively the value of proper methods of treating venereal cases in the Army.

MAINTAIN INDUSTRIAL EFFICIENCY

For the protection of the fighting men as they return home, and to maintain maximum industrial efficiency, venereal disease among the civilian population must be kept under control. There is the same necessity for proper methods of treatment as existed in the service. *Self-treatment and quackery must go.*

RESPONSIBILITY OF DENTISTS

Dentists must share the responsibility for preventing the spread of syphilis. It is found in all walks of life, all classes of society, and it is too often not recognized when examinations of the mouth are made for dental treatment. Persons who have lesions in the mouth and know they have syphilis, and admit it, do not as a rule seek the services of a dentist unless compelled to do so. Those who have lesions and are unaware of their condition present themselves to the dentist unsuspectingly, and for that reason are a serious menace to the health of the dentist and his clientele.

The ease with which the disease is transmitted is well known to the members of the profession. A break in the skin or mucous membrane, a spirochete gaining entrance and passing into the circulation—and infection occurs. Syphilis is no respecter of persons; neither is it a respecter of tissues. The simple scaling of the teeth may, and usually does, involve a breaking in the continuity of gum tissue and exposes the patient to any infection carried on an unclean instrument. In view of the prevalence of syphilis and the difficulty with which the germ of this disease is destroyed, it is of the highest importance that dentists continue to study and practice the principles of asepsis in all phases of their work. It should be borne in mind that the saliva of those infected with syphilis is usually loaded with spirochetes, and that it is not necessary that blood be drawn from a patient in order to infect another through the application of instruments.

Recognizing the various lesions found in the mouth, which are signs of definite diseases, requires clinical knowledge and experience. Many infectious diseases produce lesions in the mouth, and the study of these lesions, which might enable the dentist to recognize such infections, as well as the infection of syphilis, is extremely interesting and should be of material benefit to the dentist. It is believed that if the question of venereal diseases were discussed more freely and frequently in study clubs and dental societies, it would be a benefit to society and reflect credit on the dental profession.

Recent investigations have clearly proved that dental structures are an important part of the human economy. The man who treats his case symptomatically is most likely to fail. Dentists have been confronted with increased responsibility in the matter of general health, not merely because they have aspired to greater things, but because it has been thrust upon them, and the proposition must be met face to face.

COOPERATION OF PHYSICIANS, DRUGGISTS, AND ADVERTISING MEDIA

The campaign now being carried on among dentists is similar to those carried on with physicians, druggists, and advertising media. It should interest you to know that approximately sixty-one thousand, or nearly fifty per cent. of the physicians of the United States, and that approximately twenty-eight thousand, or nearly sixty per cent. of the druggists of the United States, have signed and returned agreement cards obligating themselves to cooperate; and in addition to these, more than ninety-nine per cent. of all newspapers and periodicals in the United States carrying advertising have pledged themselves not to carry quack advertising.

WEIGH THESE QUESTIONS

Will the dental profession accept its share of the burden which this work requires? On the receipt of a card, properly signed, the Public Health Service will ask your State Board of Health to supply you with additional scientific and miscellaneous literature.

RUPERT BLUE, *Surgeon General, United States Public Health Service.*

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

AMERICANIZATION

The so-called Americanization Movement among our foreign-born population is all very well; but to one soaked to the spine with the American tradition it would seem that many of those actively engaged in it have quite the wrong slant, and are likely to bring about at least as much harm as good. The object that should be sought is to impress upon the minds of aliens the tremendous advantage of being allowed to become citizens, and common sharers in all that citizenship means without paying the enormous price that our forefathers paid in hardship, in self-denial, in their blood, and in life itself, in order that America might become what it is; and that this advantage, this wonderful opportunity, must be paid for by appreciation, in loyalty and heartfelt devotion, to say nothing of gratitude to those who have made, to those who have maintained, and to those who are maintaining in this country such opportunities as exist nowhere else under the sun, opportunities limited only by the blue sky and the far horizon. This is what the Americanization movement should mean; and it particularly and emphatically should not mean what some of its advocates and protagonists evidently think it means—or at least want others to think that they think it means—the coddling of the foreign-born, petting them, carrying them around on a particularly soft-soap sort of a chip, filling their minds with ideas of equality socially as well as politically, until they are coming to regard America and Americans as being in some manner tremendously indebted to them for coming here and taking up citizenship with us. These people should be taught to look upon admittance to citizenship as the greatest event in their lives, as something to be striven for with heart and soul; and when attained, something to cherish and defend, in order that their posterity may enjoy the privileges made possible to them by those who made and are making America what it is. This is my idea of what Americanization should mean; and I very greatly fear much of the work that is being done will need doing over again; just as now seems likely to be of the work done for the colored race, which, under the guidance of mistaken leaders, seems about to throw away all of the advantages granted during the past fifty years. No race under the sun is so generous as the American branch of the Anglo-Saxon; but it is the generosity of those who have overcome, who have conquered, who have attained; not the generosity of the beggar sharing his crust, doled out by charity. America belongs, as of right it should belong, to Americans; and those who cannot be made to share in the spirit of America should have no share either in its material advantages, whether they be of native or foreign birth. Of all the contemptible creatures stirred out by the world war, the native-born pro-Hun was the lowest, the most contemptible. It is not mere birth that makes the American; but the degree with which he can absorb the American idea and ideals, and make them the principles of his life.

LACONIGRAMS

The South is not asleep. Mobile, Ala., " 'way down in Alabam' " is to have school clinics, and oral hygiene is to be taught in the public schools. The Red Cross and the Federated Women's Club have agreed to pay the cost of installation and conduct as a beginning.

The new Kansas law requiring annual dental inspection of each pupil, is now in operation. The teeth of every school child must be examined yearly, except such as can produce a certificate from a reputable dentist as to the good condition of the teeth.

On December 9, forty dentists of the San Diego, Cal., society examined the teeth of the school children, making no charge for the service. A school dentist has been engaged.

Iowa claims to have the finest dental college in the United States. Mebbe. We are not so far east that we are purblind to things western. Iowa is a great state, one of the greatest; and anyone who ever has visited it, spent months there as have I, must have been impressed with the air of clean young manhood that seems to pervade the very atmosphere he breathes. There are great states in this commonwealth of ours, but none greater than the Giant of the north. If her dental school is not the finest ever, she knows it already, and will soon make it so.

Graduation from high school and one solid year in some accredited college of liberal arts are the 1921 requirements for entrants in the Iowa four-year dental course, making five years of college work prior to license.

With regret we record the serious illness, of diphtheria, of that good friend of, and contributor to THE DENTAL SUMMARY, Dr. Dayton Dunbar Campbell, of Kansas City, the first of whose series of papers on modern prosthetic dentistry appears in this number. Dr. Campbell writes that he has so far mastered his indisposition that it is not likely to interfere with his work on the series, and that he hopes to have the February installment ready on time; a hope that all of our readers must share with Dr. Campbell and the writer.

I wish to thank every member of The Ohio State Dental Society, officers and committees, particularly Dr. W. H. Whitslar, Chairman Program Committee, for many courtesies shown during the recent convention. What I had to say was listened to with courtesy and seeming interest, and many assurances have reached me that some of the advice offered will be taken up and followed. The very first step necessary is the correct keeping of a record of receipts and expenditures. No man can handle his business affairs with anything like intelligence unless he knows just what he is doing. So far as I know, the system briefly described before the convention is at least equal, if not very much superior, to any other obtainable. If it is not entirely understood, questions will be answered through this department.

Late in November, the United States Public Health Service announced through the newspapers that fifty dentists were wanted at once for permanent service, and that these positions would be filled from the ranks of ex-service men so far as possible. Those appointed will be commissioned as First Lieutenants and Captains, and be paid at the war rate, plus allowances, and the service will be practically under regular army conditions. Applications should be addressed to Surgeon General U. S. Public Health Service (Attention of Dental Section), Washington, D. C. Some or all of the positions may have been filled, of course; but those desiring appointments may find out definitely by writing or wiring.

Don't keep valuable papers and pay-to-bearer securities, such as Liberty Bonds and War Savings Stamps in your office safe. Rent a safety deposit box in a bank, and see that all such papers are kept there. This advice comes too late to save Dr. E. T. Sharp, of Victor, N. Y., the loss of some $1,500 in bonds and stamps, but it may prevent similar robberies elsewhere.

Wonder what unions will do next. The demand now is made that all artificial teeth bear the union label; otherwise the wearer may be subjected to all sorts of pains and penalties, including, possibly, boycot by his favorite lunch-counter. Suppose your waiter asks you to produce your plate for examination before accepting your order? Just what would you say or do? This isn't running things into the ground, exactly, but certainly does resemble something of the kind.

If a non-union molar
  Bit a union label pie
Would the pie cause indigestion
  In the sweet by and by?
Or if a union grinder
  Should find non-union meat
Before it on the table
  Would it refuse to eat?
—*Morning Telegram, N. Y.*

The New York Medical Journal declares that never within history have the teeth of mankind been in such poor condition, and never has the supply of dentists been so inadequate. "We need more and better dentists, and we need more and better dentistry." To which I can add a most fervent Amen. The more I know of dentists and dentistry the more I realize the vast field as yet not even scratched by the bur. Yet the advance in the profession during the past ten years is without precedent. No other profession ever made such a record; and I hope somebody will challenge this assertion, and make me prove it.

Burlington, Ia., has secured Dr. J. P. Hunt in the capacity of school dentist. Dr. Hunt has reopened the free clinic, and much good is hoped from his full-time efforts. The newspapers finally have recognized school dentistry as of tremendous importance, and are supporting the dental profession in its efforts to educate the public.

Dentists at Rio de Janeiro, Brazil, are basing their fees upon a time-basis of $8.00 to $10.00 per hour.

Some forty Idaho dentists are to feel the draw of the legal halter early in January, charged with "unlawful procurement of licenses, false and misleading advertising, and failure to comply with the law relative to the use of firm names." Prosecution is in the hands of a committee of dentists appointed by the state department of law enforcement. In these days when law and order are so little regarded in many quarters, and the rights and privileges of others treated as non-existent, there would seem to be plenty of work for such a department in every state.

Two dentists have done dental work to the value of $21,000 in Lenoir county, N. C., during the past two years, for school children, entirely free, including materials. Nearly eleven thousand, five hundred treatments have been given. Looks as though the solid south were in line.

Dr. (or should it be Doctress?) Juanita Wade, of Dallas, Texas, the first woman to enter the profession in that state, has made for herself name and fame as a specialist in prophylaxis, the one branch of the profession that it seems to me to be peculiarly and very widely open to the gentler sex. There is plenty of room, ladies; step in.

South Bend, Ind., is considering the installation of the second school clinic, this one in the high-school building.

The Detroit Clinic Club, seventy strong, attended the meeting of The Bronx County Dental society, New York, December 2, 3, 4, 5, in a body and put on a group of clinics in their inimitable style. At the same meeting, papers were read by our friends, Drs. S. J. Rauh, Cincinnati; F. T. VanWoert, New York and Elmer S. Best, Minneapolis. The Detroit Club is the strongest association of clinicians extant, and their work is in great demand.

The Lincoln, Neb., Society gave a home-coming banquet, December 9, in honor of the twenty members who were in the war. Special tribute was paid Dr. E. B. Zwink, the only Nebraska dentist to lose his life in the great conflict.

Will readers everywhere kindly keep THE SUMMARY informed as to date and place of coming Society meetings? We often are asked for this information, and sometimes are unable to give it.

Niles, Mich., now has both dental and medical examination in the schools. If any lesson at all was taught by the great war, it was the need for more attention to the physical condition of the children.

There will be no meeting of South Dakota Dental association in January, as previously and erroneously announced.

The visiting nurses of Davenport, Iowa, recently conducted a flower sale for the benefit of the fund being raised to establish free school dental clinic. Quite a sum was added to the fund.

A movement has been started in Virginia, having for its aim the founding of free school clinics. Recent examination has shown that about sixty per cent. of the children of that state have defective teeth, due entirely to neglect.

Boonton, N. J., school clinic opened December 1, for the year. The clinic will be in operation every Monday.

Dr. Tom Harris, Little Rock, Ark., is at the head of the school clinic in that city. Dr. Harris recently completed preliminary examination of eight hundred and six pupils, finding two thousand, eight hundred and fifty-seven teeth needing immediate attention. Notices were sent to parents. For those unable to pay, the necessary work will be done free.

Reprints of Dr. Percy R. Howe's recent paper on Dental Foci, is now ready for all who apply. To my way of thinking, this paper contains more sound sense per square inch than any other paper on this subject that I have read for a long time. Every dentist should read it.

Dr. John V. Conzett, president National, is some busy man. Nearly every report of society meeting that reaches this office contains his name among those to address the meetings. Dr. Conzett hopes to be able to keep his office open at least part of the time during his term of office, but doubts it. He is a fluent, easy talker, knows his subjects thoroughly, and holds his audiences as few speakers on dental subjects are able to do. His knowledge of the use of amalgam is profound, and he talks straight to the point.

Among the demands of the striking miners—or was it the steel workers?—was that their employers provide separate garages for housing automobiles while their owners were busy going through the motions of earning sixteen to twenty dollars per day! Do you know, this strike business would be a joke, were it not that you and I, and every other "white-collar" and professional man, must pay the bills.

A public garage has this sign displayed upon its walls: "Don't smoke in this garage. Your life may not be worth anything, but gasoline is."

Beware of Strangers!

Sometimes I "wonder at crime," and, then, sometimes I don't. And when I don't it's because dentists and others make it so darned easy. Many years ago when still a newspaper man, a noted swindler who had reformed, told me that the one thing that made an honest life so hard was the fact that most people go about begging somebody to take their money away from them. Here's an instance:

New Rochelle, Dec. 6.—Earl C. Williams, of Chicago, alias Dr. George Harris, who, the police say, is wanted in no less than twenty cities for victimizing dentists, was arrested this afternoon just as he was about to leave town with seventy-five dollars which had been obtained from six local members of the profession.

Williams, it is alleged, represented himself as the representative of a surgical instrument concern and took orders and pay, but did not send the promised goods.—*Brooklyn Standard.*

Another case similar to that published last month. Maybe the same man. Aliases are easy so long as one has access to a dictionary of proper names.

Later: Reports state that Williams pleaded guilty on arraingment, and was given a sentence of six months' imprisonment. When that sentence expires, he will be taken to Norfolk, Va., where he is wanted on a similar charge. By that time, doubtless, other authorities will be advised, with the chances largely in favor of an extended term before he is through with his little picnic. Which is all very well; but why, under the shining sun, should he ever have been able to put it over? Surely, there are enough well-known supply houses to take care of all dental needs. Why take a chance? Just for the love of adventure—is that it? I dunno.

Dr. R. Boyd Bogle, dean of Vanderbilt, Nashville, addressed the Southeastern Iowa society at Ottumwa, December 5, on pulpless teeth and the significance of curettage in practice.

Oklahoma—Eastern

Muskogee, Okla., Nov. 25.—The Eastern Oklahoma Dental society closed its annual session tonight, electing officers as follows: J. H. Crockett, Atoka, president; E. M. Bradley, Muskogee, secretary, and C. P. Keim, Muskogee, treasurer. The next annual meeting will be held in Okmulgee.

Kentucky—Jefferson County

Louisville, Nov. 21.—The Jefferson County Dental society held its annual dinner and election of officers last night. New officers for the ensuing year are: president, William E. Goepper; vice-president, E. P. Marciliatt; secretary, Bruce C. Funk, and treasurer, Max Danhauser.

Resolutions upon the death of Dr. E. M. Kittig, a charter member of the society, were adopted. Illustrated clinics in partial denture work were by E. H. Hubbuch, J. H. Fullenwider, J. B. Jordon, Charles S. Pearcy and J. O. Gable.

Indiana—Wabash Valley

Kokomo, Nov. 13.—The fall meeting of the Wabash Valley Dental Society was held here yesterday. The officers of the society are F. R. Houck, Huntington, president; A. L. Harter, Kokomo, vice-president; J. M. Doyle, Peru, secretary; W. W. Horn, Logansport, treasurer. The program is as follows:

CLINICS AND DEMONSTRATIONS

Cast Construction and Artificial Dentures—I. Lester Furnas, Indianapolis.

Oral Surgery—Earl Brooks, Noblesville.

The Making of a Roach Appliance—Edwin S. Hulley, Marion.

Removable Bridges and Their Attachments—H. F. Gravelle, Marion.

Roach Clinic—M. W. Strauss, Huntington.

X-ray Interpretation—C. A. Nixon, Valparaiso.

Laboratory Pointers and House-Hall System Plates—Frank M. Stipher, Indianapolis.

Roach Clinic—M. E. LeGalley, Lafayette.

Removable Bridge Work, Using Roach Attachment No. 2—J. B. Gordon, Marion.

Orton Crown and Bridge Work—D. E. Delzell, Logansport.

Something in Cast Gold Inlay—J. L. Helmer, Kokomo.

Correcting Occlusion in Attachment Cases—J. Ed Wilson, Kokomo.

Removable Bridges—D. R. Garber, Peru.

Illinois—Fox River Valley

Geneva, Ills.—F. W. VanVoorhis, of Elgin, was elected president of the Fox River Valley association, at its recent meeting. S. A. Henry, of Wheaton, vice-president and Arthur L. Roberts, of Aurora, secretary-treasurer.

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May we send a bottle of Listerine to your address, Doctor, for your observation and use?

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PROMINENT DENTIST MURDERED

Shot in his own Home by Pro-Hun, Because of War Activities

Dr. Horace A. Benson, sixty, a prominent dentist and one of the foremost citizens of Norwalk, Ohio, was shot to death, November 26, by Charles Rehfeld, a farm laborer and admittedly a pro-German, who, it is reported, has confessed the crime, saying that Dr. Benson had provoked the deed by his anti-German activities during the late war. Police state that Rehfeld also plotted the death of Dr. Carl Schneerer, a physician, for the same reason.

Rehfeld, who was captured by a posse after an all-night search, is said to have confessed that he shot Benson with a dum-dum bullet. The bullet, which was sent crashing through a basement window in the Benson home as the dentist was attending the furnace last night, entered the victim's back, pierced the heart and brought instant death.

After severe grilling by Sheriff Roose, Rehfeld, who has been employed as a farm laborer, admitted the killing and also a previous attempt on Benson's life. The first attempt was made last Friday night when a bullet was fired through another cellar window at the dentist, narrowly missing him.

Rehfeld was interned for some time during the war because of his alleged seditious utterances and actions.

Dum-dum bullets were found on Rehfeld when he was arrested after the sheriff's posse had surrounded a barn about six miles from town where the murderer had taken refuge.

"I would have killed the posse, too, if I had had time," Rehfeld is alleged to have told the sheriff.

A high-power 44-caliber rifle was in Rehfeld's possession. Rehfield is forty-five years old.

Arizona State Dental Society

The annual meeting of the Arizona State Dental Society, was held in Phoenix, November 5th, 6th, and 7th.

An interesting program was rendered and the following officers were elected for the ensuing year: John T. Dunlap, president; W. G. Barackman, vice-president; J. C. Roberts, secretary-treasurer.

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An Interesting Relic

By courtesy of my good friend, Dr. H. L. Ambler, of Cleveland, I have been permitted to examine and comment upon an account book kept by Dr. E. C. Sloan, who practiced at Piketon and Ironton, Ohio, beginning in February, 1850, which I have found very interesting.

The first page is pretty well filled with a list of names under the heading: "Anticipated Plate Work," and succeeding pages bear witness to the fact that most of these anticipations were realized and capitalized—for the good Doctor was fully aware of the value of his services.

The first of many pages of this closely-filled and well-kept record begins:

"Piketon, Ohio, June 3, 1850.

"Arrived this day and commenced boarding with Benj. Armstrong, at $2.00 per week."

Other entries are:

"Left Piketon, February 1, 1852."

"Ironton, February 13, 1852.

"Commenced boarding with S. Parker.

"Due S. Parker for board previously, $5.00.

"Horse and wagon to Mt. Vernon, by Gough.

"February 27.—Horse to Mt. Vernon, five days. Left morn. of 23d."

Evidently making some progress, but still below his best, we find these entries:

"May 13, 1852—Thursday Eve.,—Bought Horse."

In view of what follows, it would be interesting to know what he paid for the nag.

"June 17.—Thursday morn. Commenced boarding with Coleman.

"July 1.—Returned this day. Been absent since June 17, except about three or four days."

"December 6.—Vacated room over bank."

Still he had not reached his stride; still unsettled. Evidently did some business over at Piketon, as the following records indicate:

June 18, 1850—

"Mrs. Chenoweth—to inserting six teeth on gold plate........................$30.00

"I. B. Tusner—to filling four cav. gold (for James) and cleaning teeth for self....$5.00

"July 1.—Miss Jane Miller—to filling 22 cav. gold, at $1.00.................$22.00

At this date he was a better collector than most, if his fees were below standard, since we find this entry opposite the Miller charge:

"Settled July 17."

Other interesting entries, for work at both Piketon and Ironton, run as follows:

"John Wes. Dunham—to filling 2 cav. gold and resetting four pivot teeth......$4.50

"Cr. by order on Dunham & Sons.....$4.50

One dollar per shot seems to have been his regular charge for gold fillings, and fifty cents for tin and amalgam.

"Aug. 27.—Mr. I. Amburg; to cleaning teeth (powder and brush)..............$1.25

"Sept. 15.—Mrs. Asa Southworth; to filling seven cav. gold, inserting one tooth on pivot, extracting, etc, total..........$7.00

"Oct. 7.—Miss Nancy Williams; to inserting six teeth on gold plate..........$24.00

This is the beginning of his prosthetic work, which runs along in this wise:

"Nov. 10.—I. Westley Dunham (wife) Dr.
To inserting nine teeth on plate....$40.00
Filling four cav., gold............. 4.00

"Miss Charity Green (Wm. Sargent);
To inserting six teeth.............$21.00

"Dec. 18.—Myron H. Peck, P. M., (wife) Dr.;
To inserting five teeth on gold plate.$20.00

"Jany. '51.—Mr. John Prater;
To inserting five teeth on plate....$25.00

Work is coming from nearby towns now, and things are moving pretty well. For instance:

"Jan. 17.—Widow Pancake (Sharonv'le) Dr.;
To inserting seven teeth on plate...$35.00

Dr. Poage, (Waverly) Dr.;
To inserting four teeth on silver.... $5.00

There are many entries from Sharonville, Waverly, Hanging Rock, Mt. Vernon, and other towns roundabout.

Under date of May 14, 1851, we find this:

"Mr. B. Armstrong; to 3 week's absence from board..........................$6.00

This indicates that the Doctor was paying $2.00 per week for living with Mr. Armstrong.

Many other entires confirm this; for instance:

"Dec. 23.—Mr. B. E. Armstrong, Dr.;
To cash to bal. acct. up to Oct. 15,
1851; 71 weeks at $2.00 per week..$142.00
Coal................................ 5.00
$147.00

As an illuminating view of the value of money seventy-five years ago as compared with present basis, note the following:

(Continued on next page)

The talent of success is nothing more than doing whatever you can do well, and doing well whatever you do without a thought of fame. If it comes at all it will come because it is deserved, not because it is sought after.

—*Longfellow.*

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An Interesting Relic—Concluded

"Piketon, O., July 23, 1851.

"Myron H. Peck, Cr.

"By making cloth pants and trimming them	$2.33
Making cloth coat and trimming it	9.50
Making satin vest and trimming it	2.25
Repairing	.10
Making tweed pants	2.00
Making cassimere pants	2.00
Making 2 pairs summer pants	2.62
	$24.62

A complete outfit, it will be noted; dress coat and "pants," satin vest, tweeds and linen, made to order and ""trimmed," for less than $25.00!

As practice grew, we find entries like these:

"Arrived at Ironton, Friday, 17 October.

"Oct. 23.—Mr. S. Parker (Ironton House) Dr.—to inserting two teeth on plate .$10.00

"Mr. Robert Scott (Mt. Vernon) Dr.;
To inserting full upper set of teeth for wife $50.00

I. O. Willard (wife) Dr.;
To four teeth on gold plate . . . . . . $25.00"

For the use of a horse for five days, he paid $2.50. For board and care of his horse he paid $2.00 per week. He paid ninety cents dwt. for old gold.

For gold upper and silver lower, his fee was $100.

"Oct. 18, 1852 (Ironton)—Mr. Daniels (architect) Dr.;
To inserting full set teeth for wife .$112.00

Mr. Ezra Culbertson (Greenup, Ky.) Dr.;
To inserting full set teeth on gold .$100.00

Mr. John Merrill, Dr.;

To upper set on silver	$20.00
Extracting, admins. chloroform, etc.	3.00
	$23.00

For less than ten teeth, his charge runs uniformly $5.00 per tooth. There is one entry of twelve teeth for $48.00.

Not until late in 1853 does he begin keeping detail records showing the teeth filled or extracted; and even then he does so only occasionally.

In one or two cases there is a credit entry for return of temporary set; but there is an extra charge in each case of precisely the amount credited! He evidently knew his people.

The names of patients may be interesting, as showing the nationality of settlers in lower Ohio and Kentucky—here are some of them:

Dunham, Wood, Hibbs, Armstrong, Chenoweth, Burton, Stewart, Greene, Williams, Miller, Peck, Amburg, Ruckman, Donnahoe, Smith, Moore, Brown, Cissna, Southworth, Martin, Prater, Wheeler, Berry, Johnson, Carrolus, Poage, Wilson, Odell, Corwin, Towner, Phelps, Barnes, Lee, Reed, Ware, Dexter, Collins, Emmitt, Iams, Lucas, Flinn, Scott, Bardwell, Young, Campbell, Berry, Burkey, Sourbunn, Van Meter, Stinson, Parker, Hustand, Long, Crumb, Irvin, Seeley, Spalding, Gage, Willard, Willis, Powell, Elliott, Peters, Jones, Crichton, Flowers, Beard, Hinton, Galen, Richy, Scoville, Meade, Kelly, Ellison, Chancey, Laughrey, Hibbard, Burdell, McGill, Shepard, Nelson, Griffith, McCormick, O'Neil, Murphy, Hampton, Henderson, Maxley, Culbertson, Coleman, Evans, Irons, Chapman—nearly all of them English, Scotch, Irish or Welch.

The total amount of fees entered, from June 18, 1850, to June 22, 1855, is $3,903.66. Equal to an income at the present time of $3.000 per year.

DEATHS

At Brooklyn, N. Y., November 12, Dr. William Edwin Dunn, aged 61. Dr. Dunn is credited with the discovery of continuous gum work in dental plates. He was born at Delaware, Ohio.

At Washington Heights, New York City, October 30, as the result of an automobile accident, Dr. Fletcher Brainard, aged 72.

At Aurora, Ills., October 30, Dr. John C. Y. Moore, aged 57.

At New York City, November 2, Dr. Herman Sivin, aged 61.

At Dayton, Ohio, October 24, Dr. John A. Sinnett, aged 55.

At the Mayo Institute, Rochester, Minn., October 23, Dr. E. M. Kettig, of Louisville, Ky., aged 56.

At Madison, Wis., October 8, Dr. Otto C. Schmedeman.

At Belmar, N. J., October 21, Dr. Robert Rutherford Underwood, who had retired from practice at Lancaster, Pa., about five years ago.

At Jefferson City, Mo., Nov. 14, of pneumonia, Dr. H. K. Enloe, one of the best known dentists in central Missouri.

At a hospital at Pawtucket, R. I., following an operation, Dr. Jack H. Masterson, of Oneso, Conn., aged 31.

At Freeport, Ills., Nov. 26, of dropsy, Dr. J. A. Knepper, aged 72.

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At Pattsville, Pa., Nov. 9, of acute indigestion, Dr. Howard Barger, aged 30.

At Detroit, Mich., Nov. 11, Dr. Alfred Lowther, aged 58.

At the University Hospital, Philadelphia, Nov. 12, Dr. Nathaniel Gildersleeve, professor of microbiology and bacteriopathology in the Evans Dental Institute, University of Pennsylvania. Classes in the institute were suspended for two hours on Nov. 14, in respect to his memory.

At Chico, Cal., October 30, Dr. Archibald B. McFayden, aged 71.

At Chicago, Nov. 26, Dr. Charles H. Converse, aged 71.

At Richmond, Va., October 25, Dr. K. W. Small.

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DETROIT AKRON

At Chicago, Nov. 24, Dr. Alexander R. MacDonald, aged 49. He was one of four brothers, all practitioners of dentistry in and near Chicago.

On December 8, the body of Dr. Woodford L. Tilley, of Denver, Colo., was found in a sleeping-car berth of an east-bound Santa Fe train, at Syracuse, Kan., with the throat cut. Suicide is suspected, as Dr. Tilley had not been well for some time.

At Central Square, N. Y., Nov. 25, of paralysis, Dr. E. D. Bates, aged 65. Dr. Bates was dentist to the late Porfirio Diaz, President of Mexico.

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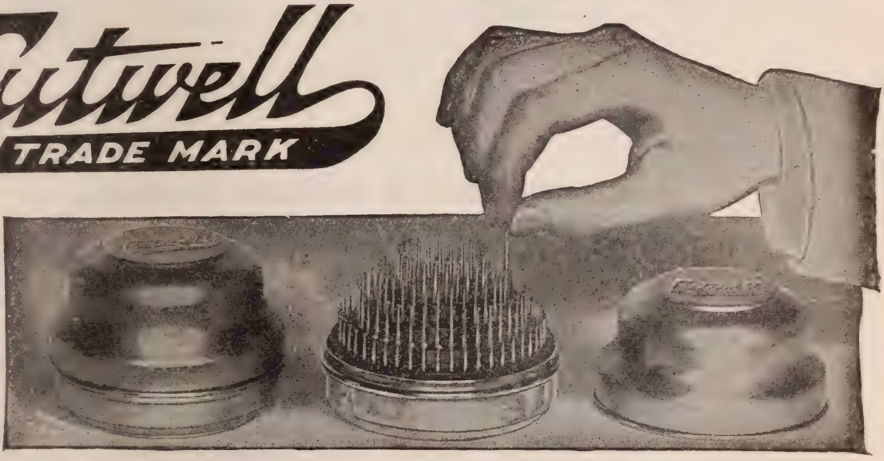

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THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL February 1920 No. 2

THE PORCELAIN JACKET CROWN AND ITS PLACE IN DENTISTRY*

W. D. VEHE, D.D.S., MINNEAPOLIS, MINN.

IN OUR RELATIONS with our patients, it is our constant desire that we render them the best possible service according to the requirements of each individual case as we see it, and further, that we proceed through our life cycle with our minds ever on the alert for the ripening of our judgment and to increase our store of knowledge. It is only when we cease to do this that we stop our mental growth and may become a menace instead.

It affords me great pleasure to appear before the members of this society with the subject of porcelain. This is a most fascinating subject with no limit to the development of our ability. So that we may focus our minds more quickly on this important subject, let us picture in our minds a case demanding a restoration, and let this case be in our own mouths in which an anterior tooth is broken down, involving both angles with possibly the labial surface as well, and with the pulp vital and healthy. There is no question but that we would give serious thought to the mode of treatment and I believe everyone of us would restore with a jacket crown as being the best procedure. I think I am entirely safe in predicting this. I believe no other procedure would serve quite so well from every standpoint, and if we choose such a treatment for ourselves, we will dare to do no less for our patients.

In treating the subject of the Porcelain Jacket Crown, I have in mind that this type of crown is one form of treatment of the variety of cases that present themselves, and that it is not indicated universally any more than any other form of restoration or mode of treatment. In other words, in the treatment of this subject, I do not overlook the magnitude of the subject of dentistry and that I am presenting a phase of it, important though it is.

I desire to point out as well as I can, not only its indications but I shall try to make a word-picture of the technic so that we may all become more familiar with this wonderful crown and not underestimate it. There are well-defined cases where it should be used and where no other restoration will serve our patient so well, not only in esthetic appearance but in the absence of irritation to the pulp and gum tissues.

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*Read before the Nebraska State Dental Society, May, 1919.

Before going further into this subject, it might be well to refresh our minds with the history and development of porcelain and also of its usual composition. The porcelain art is a comparatively old and an important one. We read of it as having been used by the Chinese about the fourteenth century. It, however, was not applied to dentistry until about 1774, although it was suggested by Fauchard for the making of artificial teeth as early as 1728. In 1885-7 platinum and gold were first used as matrix material and in about 1903, Dr. Land introduced the jacket crown as we now know it.

The composition of porcelain, briefly, consists of silex, kaolin, and feldspar, called the basal ingredients; a flux composed of borax, sodium or potassium carbonate, or glass containing sodium or potassium carbonate, and a pigment or coloring matter, which is made up of a few metals and their oxids. Many times starch, gum of tragacanth or other ingredients are added to enable the mass to be more easily carved. The basal ingredients and the frit (which is the flux and pigment mixed with a quantity of feldspar) are mixed together, fused and re-ground and fused and re-ground again, when it is put up as it reaches us. Different manufacturers necessarily vary the formula and make-up of their product and I can only state this in a general way.

The cases in which the jacket crown is indicated are primarily, malformed teeth, malformed through some hereditary influence possibly, or through some condition of malnutrition but still having vital pulps. These teeth are unsightly and many times are tender or decayed and these can be restored beautifully in this manner. Teeth that have had a portion of the crown destroyed through decay, accident or otherwise, or teeth that through abrasion must be lengthened in cases where the bite is to be opened, and still have vital pulps, can be so restored most generally. It is but seldom that an insufficient amount of structure remains with the pulp still intact. So you can see that in cases where the pulp remains vital and we must resort to or wish to resort to a crown, the jacket crown should be first choice; and we need not confine it to the anterior teeth alone but to the ten anterior teeth and further, if for esthetic reasons we see that it is indicated.

In cases of malalignment of teeth, we must be more careful, in that we must not encroach too close to the pulp and thereby possibly cause its destruction, but many teeth can be handled in this way if we choose them rightly and carefully.

Pulpless teeth that are not condemned to the forceps and are discolored or malposed, mutilated through decay, accident or otherwise so that they must be crowned can be restored, providing sufficient structure remains to afford the necessary anchorage. If the structure remaining is insufficient for the required anchorage, a post can be used or the portion first built up in some way.

The advantages of porcelain in these cases are: Esthetic appearance, lack of thermal or electrical shock, more prophylactic.

The disadvantages might be classified as: Friability, difficulty to obtain proper color.

I believe we can overcome the possiblity of fracture, at least minimize it to the utmost, by rigidly observing proper articulation, and the color difficulty certainly can be made to be less of a disadvantage by study and experience, although to the beginner it is bound to be a problem.

The preparation of the tooth for the jacket crown is not difficult and the instruments that are required are few and well systematized. It is important that we leave the mesial and distal walls as parallel as possible and still be able to obtain an accurate impression to protect the pulp horns, and to gain the maximum amount of retentive resistance. A definite, uniformly-wide shoulder of about three-quarters mm. should be made well below the free gum margin and smoothed with proper chisels so that it will be at right angles to the surface of the tooth at that point. An accurate impression and a carefully-made model are positively necessary and no compromise should be accepted.

Regarding the color difficulty, I wish to say a little more. There is no question, even though we are conscientious, but what we will have some failures because of an improper color analysis or interpretation as the case may be. Before we can expect to become at all efficient we should study the theory of color and the reflection, refraction, and absorption of light on different surfaces. The selection of proper color is as much scientific as is any other part of the technic.

We also must be familiar with the distribution of color and in selecting color we must study the individual tooth to be able to recognize the delicate saturation. I believe this is the foundation in our interpretation. We should be entirely familiar and positive in the imitation of the color of a tooth with our porcelain bodies, and this can be begun at least by mixing different colors in varying proportions and fusing them into sample pieces which can be retained profitably for future reference.

Matrix making is not difficult and I need not say much about it until I show my clinic. The matrix should, however, be re-burnished before each addition of porcelain so there can be no question of its accuracy.

The porcelain body is mixed with distilled water with the different colors in proper proportions. Some agglutinating material such as starch, gum of tragacanth, or similar substance may be added if one wishes to. Great care must be exercised to keep the porcelain mixed up to prevent it from becoming contaminated with foreign matter that might cause discoloration or bubbles. In the fusing of the body, particular attention should be paid to a proper fusing, that is, not to overfuse nor at the same time to underfuse, but to fuse to that desired degree of temperature that will not give you an artificial gloss nor a roughness. In either over or underfusing, the real strength of body or the proper color cannot be obtained. Porcelain unlike metals, does not have a definite fusing point; therefore, even though we make use of a pyrometer, unless we fuse to the same degree of temperature in the same time, we do not have a uniform result. I cannot overemphasize this point. As in color selection, experience makes one perfect in this phase of the work as well and again I wish to emphasize that you do laboratory work to become more familiar with proper fusing at the same time that you are working for color formation. Porcelain can be biscuited a number of times before it is brought to a full fusing, but when it is once fully fused it should not be subjected to that same temperature again, and should it be necessary to add any more porcelain we should use a lower fusing body to complete the work.

In the building of the crown, we should have an accurate cast and an articulating bite if necessary. Then only will we be able to recognize the individual tooth anatomy. It should be our purpose to do more than build an averagely-contoured crown. We have it at our command to imitate individual tooth anatomy except in some rare cases when these earmarks cannot be recognized, and we have not taken full advantage of the wonderful possibilities of the operation unless we do. The most of us have almost forgotten the many pleasant (?) hours that we spent at college studying tooth anatomy, and I am sure that a review of the subject would not be amiss; but do not fear, I shall not make the effort to present it here tonight. We should not rely on our mental picture of a crown unless it is accurate, but we should have an assortment of natural teeth before us to aid us in the working out of tooth form. The more deeply I become involved in this great work the more I refer to these teeth and in looking back on my early efforts, I wonder how I dared insult nature the way I did. It is desirable to build the crown slightly fuller rather than smaller to be able to correct the fine markings of a tooth by grinding while fitting it in the mouth before the final fusing, and in carving depressions and sulci have them deeper than it is desired they should be, because they have a tendency to become obliterated in the fusing. The same caution can be given in the building of sharp angles.

The fully-fused crown is approximately one one-thousandth-inch larger than the preparation, and theoretically, by grinding through the thickness of the foil it should be right, but in my hands it is not true in that it is a little inside of the periphery, therefore, I do not quite grind through the foil.

To be able to stain a crown gracefully and not to overdo it requires study. In this work we must study the color, location, and depth of the stain, and we must understand whether we can get the desired effect by surface application or by placing it in the body of the crown. I am sorry I cannot go more fully into this fascinating subject, but the time required for the description of my technic will not permit it and besides the subject of staining is a study in itself.

TECHNIC

In many cases it may be desirable to take an impression before beginning the operation for a reference cast, and especially is this desirable when restoring more than one tooth, as it shows the original condition and helps in the building of the crowns.

In beginning the preparation, make the first cuts with a three-quarter-inch Joe Dandy disk on the mesial and distal, parallel with the long axis of the tooth, as represented by *Fig. 1*. Start the cuts at the incisal or occlusal so that when the stone reaches the gingival tissues a shoulder of about three-quarters mm. will have been made, and at the same time carry the stone well around to the labial or buccal and lingual surfaces without injury to the adjoining teeth or tissues. Avoid, however, starting the stone so that the cuts will necessarily diverge toward the gingival as this only endangers the pulp and does not give as positive retention. In using stones in the mouth they will be much less painful to the patient if comfortably hot water is plentifully applied on the revolving stones. The next cut is made with a wheel of about five-eighths-inch diameter by a two mm. face, and the incisal or occlusal portion is removed to permit of a proper thickness in the crown (*Fig. 2*). In the incisor teeth make this cut so the surface made will be at right angles to the force of occlusion; and in the posterior teeth the cuspal outline is preserved to avoid pulp irritation, and all cuts must be left as plane surfaces at right angles to the articulation stress to stabilize the crown. This is well shown in *Figs. 5 to 9*. The labial or buccal and lingual surfaces are

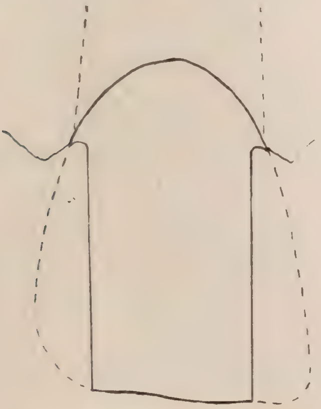

Fig. 1

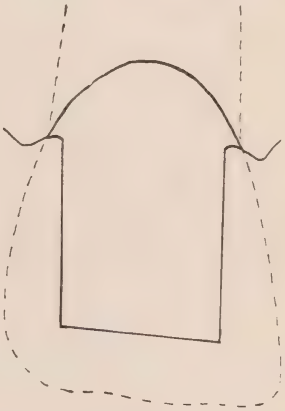

Fig. 2

Fig. 1—Showing the first cuts to be made in the preparation.
Fig. 2—Showing the next cut that is indicated along the incisal.

next cut down (*Fig. 3*), with the same stone as for the previous cut or one a little smaller. Because the lingual surface is not always cut sufficiently far, attention should be directed to this surface as well so the proper lingual anatomy can be given the crown without making it too thin. At this time a band should be fitted, festooned and put aside for taking the impression later. Next begin a shoulder on the labial or buccal and lingual surfaces with an inverted-cone stone, and carry this stone around to meet the shoulder already started on the mesial and distal, and cut through the enamel. This shoulder should now be carried well below the free gum margin by using an end-cutting bur of about three-quarters mm. face. If it is necessary to even out the width of the shoulder, which should be a uniform width of three-quarters mm., it can be done with a No. 57 bur. Trim up the preparation now and see that there are no undercuts to interfere with obtaining an accurate impression and finish this with fine sand paper or cuttle-fish disk. Plane the shoulder all around and leave it at right angles to the surface at that point (*Fig. 4*). Use an ordinary hoe, 10-4-6, and contra-angle hatchets, 10-6-12, right and left, for this work. This preparation should involve but little more than the enamel of the tooth and should be made without tissue laceration. Where much enamel is to be removed on the labial or buccal, the work may be expedited by cutting ridges through it with a knife-edge stone as suggested by Dr. F. H. Orton and then pried off with a chisel. *Figures 5 to 9* show enlarged preparations of the incisor and the posterior teeth, giving a labial or buccal and mesial view. The preparation for the cuspid tooth is the same as for the incisors except that the incisal cut follows the cusp outline, and in the lower incisors the incisal margin is left a plane surface to meet the labial surface at an obtuse angle at right angles to the direct stress.

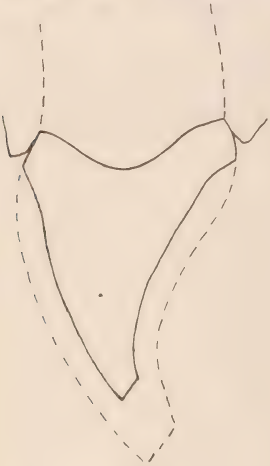

Fig. 3

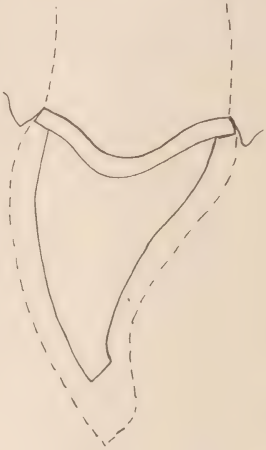

Fig. 4

Fig. 3—Showing the cuts to be made on the labial and lingual.
Fig. 4—Showing the completed preparation.

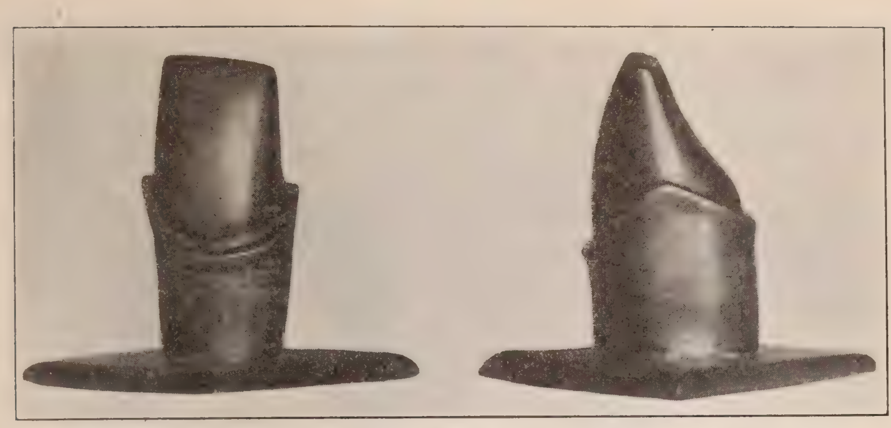

Fig. 5—Showing a labial and mesial view of the upper incisor preparation.

The secret of impression taking is to have a properly-fitting band and then have the impression material of the right consistency. This band should meet the tissues evenly and should be only large enough to easily pass over the shoulder. When a band is fitted in this manner there will be less inconvenience to the patient in taking the impression and an accurate impression more positive. Wash the preparation and fill band with Kerr impression material, being careful not to overheat it, and carefully force to place, working it while so doing to make sure it passes beyond the periphery of the shoulder all around. Keep this impression under pressure while it is cooling and chill it by using small gauze sponges dipped in cold water rather than the free use of cold water for obvious reasons. Remove very carefully and invest this impression by filling a Mellott's rubber ring with thin plaster of Paris and forcing the impression down into it as soon as the plaster is sufficiently hard or thick not to run over the margin into it. Force the impression down far

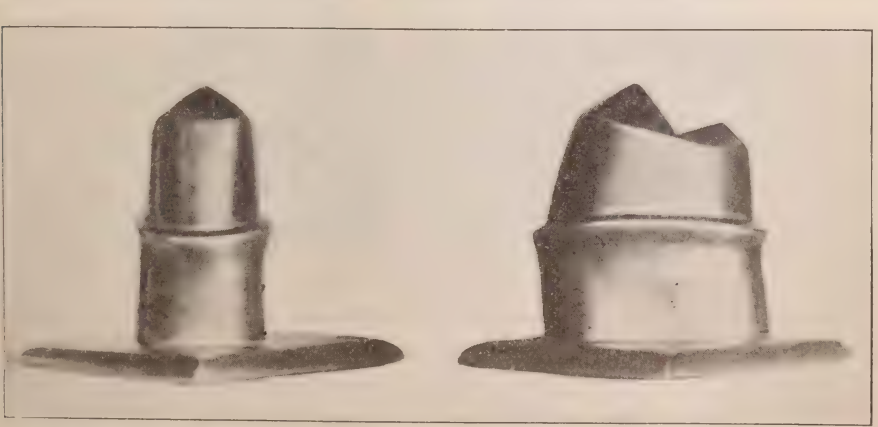

Fig. 6—Showing a mesial and buccal view of a lower bicuspid preparation.

enough, perhaps about a half-inch, to have the plaster act as a matrix in making the metal die or model. Next take a small quantity of soft impression material and with the fingers as a guide, shape it over the preparation, drawing it back and forth as it cools to free the contact. Chill and leave it in place to take a plaster impression over it so it will be removed with this impression. If one chooses to use a two-piece modeling compound impression, as worked out by Mr. Supplee, such can be used instead of the plaster. For many cases and especially in the making of posterior crowns, it is necessary to take a wax bite as well to work on articulated casts. I consider the matter of proper impressions too great to slight in any way, and they certainly should be insisted upon.

Now before dismissing the patient make a ferrule of two thicknesses of white-base plate gutta percha and dip it in eucalyptol after it is softened, and then put it aside until the preparation has been dried when it will be cool enough and yet soft enough to be comfortably shaped in place. If there is any doubt about its remaining in place it is best to cement it with a temporary cement.

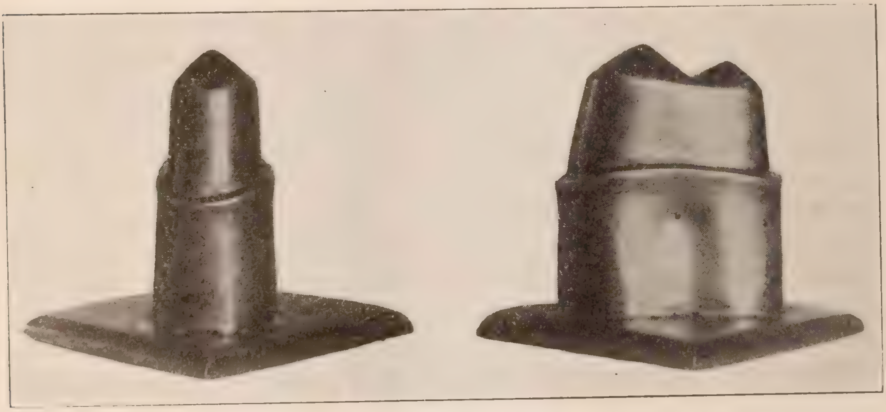

Fig. 7—Showing a mesial and buccal view of an upper bicuspid preparation.

The metal model or die can be made either with the copper or silver alloy, building up the die in part or entirely with it. If only built in part then a short sixteen-gauge pin should be driven into the still soft alloy to support the cement to complete it. In the larger metal dies, the latter method is the quicker. Place this die in the impression material in the impression and fasten it with wax. Use a separating medium that will not obliterate the fine markings in the impression and make the cast. Place the cast in the bite and make the articulated casts. Next remove the metal die and make the matrix.

It is difficult to show the making of a matrix so I will not make the effort until in my clinic. Suffice it to state, that I place the seam on the side where the crown will be the thickest, and that I solder it with a very small piece of pure gold for the reason that the seam is of less bulk, and that the matrix will be annealed at the same time for the final burnishing.

Having made the matrix, now coat the interior with vaseline and mix up a small quantity of plaster of Paris. Carefully fill the matrix with the plaster and put a quantity on a slab perhaps an inch high and set the filled matrix on top. This is done for the purpose of making a form to wrap paper around to act as a matrix in building the porcelain. When the plaster has set, carve up this form from the mass and shape it so that when this paper is placed around it, it will assume an outline similar to what the finished crown will be, only slightly larger. *Figure 10* illustrates the carving of this form to obtain proper contacts and it will be noted that to build to meet the contacts represented by the solid lines, necessitates a form such as shown by the straight solid lines, while contacts represented by the dotted lines require a form shown by the straight

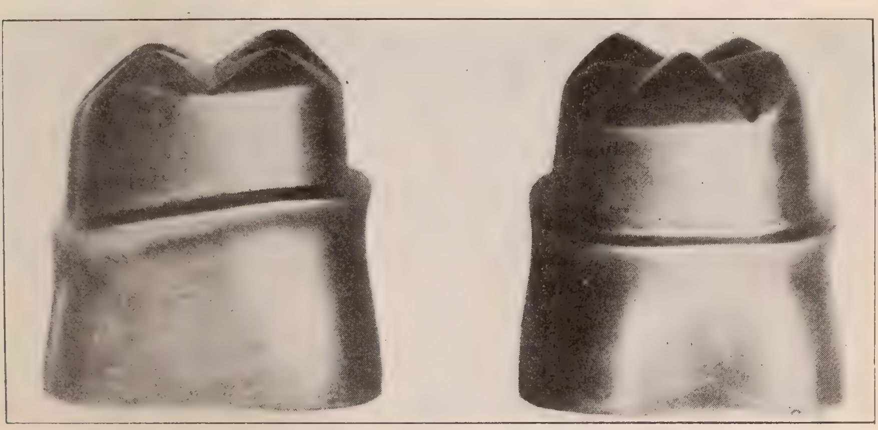

Fig. 8—Showing a mesial and buccal view of the lower first molar preparation.

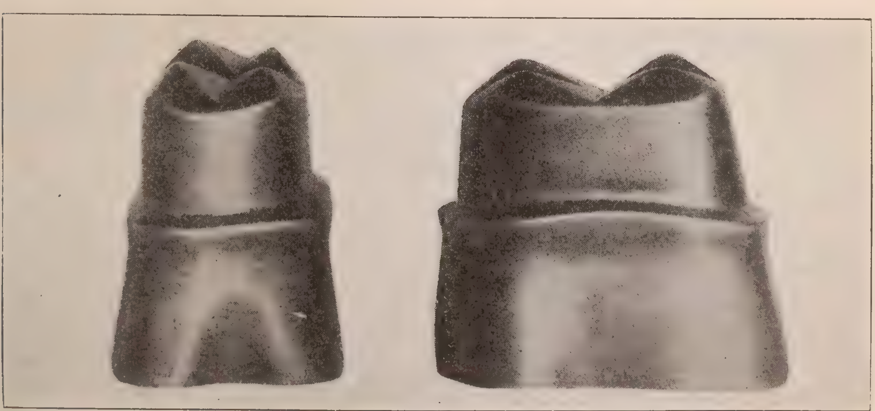

Fig. 9—Showing a mesial and buccal view of an upper molar preparation.

dotted lines. A mesial view of this form usually shows it to be parallel but not always, for it may have to converge or diverge toward the matrix as the case requires. The matrix is now removed, cleaned, and an alcoholic solution of shellac placed on the shoulder only, and the building of the crown is next in order.

At this time it is necessary to understand the proper color interpretation and therefore the color selection should be made and recorded. The teeth from which this color selection is made should be clean and normally wet. Select the color of the gingival portion first with the aid of the porcelain sample shades in a well-diffused light, and record it on a diagram made to resemble *Fig. 11.* Next carefully select the color for the incisal or occlusal portion and record it in the same way. It is next necessary to work out the distribution of the color in the tooth and that is done in this way: Concentrate your attention to the gingival color only and trace it down on the surface of the tooth to where it ends in this tooth, and record this on the chart as being slightly lower or longer than was found in the tooth. Note the extent of this color on the mesial and distal and record it in the same way. This latter shows the thickness to which the incisal color should be overlapped and should be carefully traced out, and for convenience let this be illustrated by *Fig. 11*, by the solid lines. The incisal or occlusal color is diagrammed in the same way, by noting carefully how far it extends gingivally and recorded, like in *Fig. 12.* solid lines. A cross section of the selection for the above tooth is shown in *Fig. 13.* Each case is of course, a law unto itself because it is but seldom that one finds two selections that are alike and it takes experience to recognize these differences. Experience is necessary also to be able

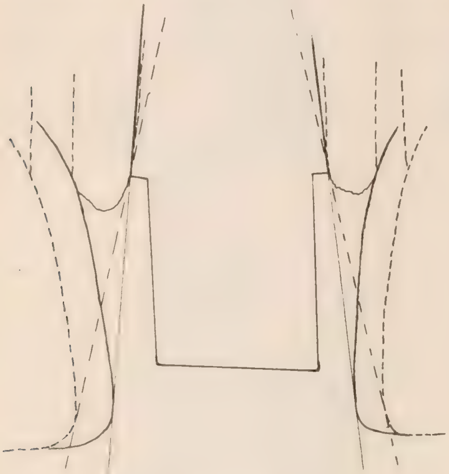

Fig. 10

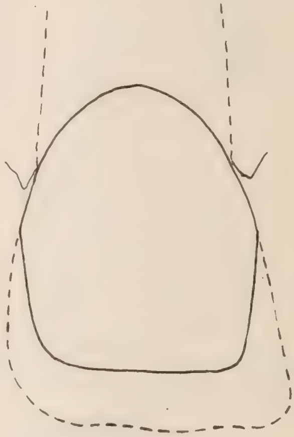

Fig. 11

Fig. 10—Showing the idea of making the plaster form for wrapping the paper matrix.
Fig. 11—A diagram of the gingival color distribution.

to recognize the right hue and then not interpret it as a shade or tint in the building of the body, as is also the matter of overlapping the incisal porcelain to the proper thickness. A diagram similar to *Fig. 11* is all that need be made for the recording of these color markings, and any other data may be recorded at this time that may be of assistance in obtaining a properly-interpreted coloring in the crown.

Now in the building of the body proper, place the matrix on the plaster form after the porcelain is mixed up on a clean slab, and wrap a piece of semi-glazed paper around this form and cut it off to a length to build the gingival color, having fastened it previously with a pair of lock tweezers. Have the porcelain mixed to a cream-like consistency and after working it over the surface of the matrix with a small brush, fill up this paper form while it is vibrated by drawing a serrated instrument over the tweezers, being careful not to confine any air bubbles in adding the body. As the moisture comes to the surface, it should be blotted off and this vibration and blotting process kept up until no more moisture comes to the surface. Remove the paper now and place this built-up mass on the die in the cast and carve it up to similate the gingival color, at the same time allowing for the contraction that takes place in the fusing. Body that is carefully built in this way and the air carefully worked out becomes very dense and very much resembles ordinary crayon. It is best now to fuse this to a medium biscuit before adding the incisal portion, so after biscuiting, with the blade of the carver force the matrix back on the shoulder if it pulled away in the fusing, and then re-burnish it around the periphery. If it was necessary to grind the fused portion of the body, then this must be cleaned by washing it and the use of a spray bottle under pressure is a most excellent way of accomplishing it,

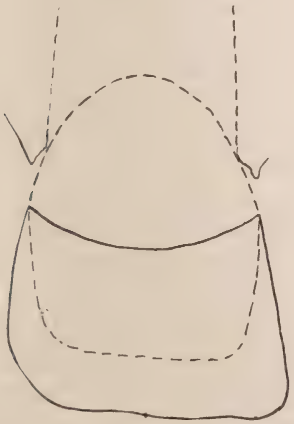

Fig. 12

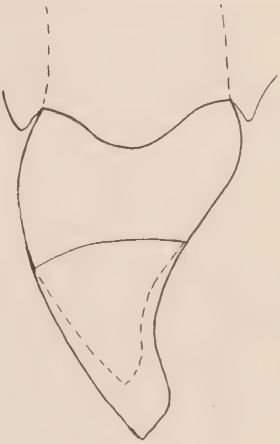

Fig. 13

Fig. 12—A diagram of the incisal color distribution.
Fig. 13—A mesial view of the color scheme worked out.

as was suggested by Dr. George Thompson, before doing the burnishing. Place it back on the plaster form now and fill in the margin of contraction with the gingival color, then re-wrap with this same grade of paper and add the incisal porcelain in a cream-like consistency in the same way as before. Place the mass back on the metal die in the cast, carve to full contour, at the same time allowing for contraction again and slightly exaggerate the contacts after it is removed from the cast. This should now be fused to a high biscuit. It is not necessary to fuse the separate color additions as just described, but it may be best for the beginner to proceed in this way and it certainly is the more definite way. After building the gingival color and carving it to permit of the incisal overlap at least, it can be placed back on the plaster form, the paper re-wrapped, and the incisal portion added after previously wetting the gingival portion, and then carefully adding the incisal portion in a cream-like consistency as previously described and being careful not to have the gingival body work down, and in that way destroy the color distribution. After the paper is removed, the mass can be placed on the die and carved to full contour in the cast, making allowance for the contraction and exaggerating the contacts after it is removed from the cast. This can now be fused to a high biscuit and from now on whether built in one or two fusings, the technic is the same for its completion. For the finest results it should now be tried in the mouth and corrected for contact contour, and articulation. Make sure at this time that there is no actual contact on either the mesial or the distal so that the crown can be pressed down in place. Next wash the crown and burn off the materials that have gathered on the crown in the mouth, which can be done quickly by placing it in the furnace heated to 1500 Fahrenheit for a moment, when the crown is placed back on the die and again re-burnished before the final necessary contouring is done. The paper matrix is not necessary for this last addition of body and is not used any more. The crown is now fully fused and theoretically it is one one-thousandth-inch larger than the periphery of the preparation, but in my hands it seems to be a little less than that, as I stated before, and at this point a small true running stone should be used to only partly grind through the matrix. Clean the crown. If it is necessary to add a little more porcelain, it must be a lower-fusing body which can be built where desired, and the crown given a high biscuit which will re-glaze the portion that may have been ground at the gingival while thinning the matrix, and the crown should be completed ready for the removal of the matrix and the final setting. If the matrix is not easily removed, by placing it in water after starting will render its removal more easy.

Before finally cementing the crown, the interior should be roughened and for which purpose I prefer to use hydrofluoric acid. I believe the cement should be as nearly as possible the color of the tooth, usually a cream or yellow white, and after the crown is cleaned and dried and the preparation is cleared with chloroform, the cement is mixed to a cream-like consistency and the interior of the crown entirely filled without confining any air bubbles. The crown is then carefully moved to place. The crown should be held from movement until the cement has had time to set somewhat, when the surplus is removed and the area is carefully cleaned. Care should be taken not to leave any particles of cement under the gum margin.

The possibilities of this operation are only limited by your own ability. With this crown you can exercise your highest ideals in the restoration of the human tooth. We do not endanger the pulp and at the same time we are able to restore tooth anatomy correctly in every detail with no irritation .to the surrounding tissues. There are certain well-defined cases in which the porcelain jacket crown will render better service than any other mode of treatment that we might select.

Because this crown fulfills its mission, it, at the same time, is one of the most difficult operations that we are called upon to perform, but, gentlemen, it is not beyond the ability of any of us, and therefore let us not be content with mediocre results but rather be ashamed of all but our highest efforts.

1010 Donaldson Bldg.

DISCUSSION

Dr. Sherraden: I think you will all agree with me that we have heard one of the best lectures on porcelain and the porcelain jacket crown that ever was delivered. His technic has been so very precise and he has covered everything from A to Z so that there is very little left for discussion. However, there are a few points that I would like to speak about, and one is, I want to take this opportunity to encourage the use of more porcelain. There was a time a number of years ago when everybody used more or less porcelain when the porcelain inlay was in vogue; but after casting came in, porcelain inlays gradually dropped out and the working of porcelain dropped out with it. So there were a good many furnaces that got into disuse, and the manufacturers stopped making porcelain furnaces, and it is only lately when the porcelain jacket crown came out that the manufacturers are again looking up their porcelain furnaces and the dentists who have old furnaces are beginning to use them. There are a whole lot of uses that you can put porcelain to other than just the jacket crown. Occasionally you hear somebody say that they would be afraid to use one of these crowns on account of the preparation, it would destroy the pulp. It does not destroy the pulp. No more reason or as much reason for destroying the pulp under these crowns of this preparation than there is under a filling. The Doctor brought that out very plainly in the thermal changes which was very interesting. A number of years ago there was a clinic given at the Creighton school by a Chicago man, and the technic of his crown was a little different. He prepared on the end of a long nail or spike his tooth form; he burnished his matrix over the end of that and on that he built his porcelain. After the porcelain crown was completed, he put it back on the end of the spike, and with a hammer drove it into the end of a yellow pine two by four; then took a hatchet, split it down, and the crown was still there on the end of the spike, no checking whatever. That is a pretty good test as to the strength of these porcelain crowns. I was in hopes the Doctor would go a little more definitely into the matter of the coloring. After that technic, I suppose we should go home and make one of these crowns and get away with it all except the coloring. Those who have not been using porcelain are going to meet with a good many disappointments. The mixing of the color and the fusing of the porcelain; nobody can tell you how to do that; you have to learn it. His idea of diagramming or dividing off the surface of the tooth is very good. That is new to me and would assist it seems to me, very much in the application of the color or shading. Unless there is somebody that is opposed to the use of the jacket crown there is nothing to take exceptions to and I am not the one, because I am very much in favor of them. They get away entirely from the display of gold. It gives a shiver to me to look at one of these gold crowns in the front of the mouth. There is no excuse for it as long as you can put in one of these jacket crowns. There are so many places that you can use them. You do not have to confine yourself to a vital tooth by any means. There are so many places for it and it will improve the looks of every patient you put them on for.

THE PRESIDENT (resuming chair): We have listened to a very interesting lecture and a very interesting discussion. This discussion alone has brought to my mind the necessity of an interest in porcelain work. Now that the old fashioned pin crown is no more and we do not use the detached post crowns very much, we need the porcelain. That is, a great many do not use them and I personally think, although I may be badly mistaken, that the time is coming when those crowns will not be used upon anterior teeth. The beautiful gold crown that looms up like a brass knob on a back-house door, will be displaced by these beautiful porcelain crowns. Now I do not know anything about porcelain. I wish I did. I think, gentlemen, that it is a very interesting subject, it is a coming subject. You know that we are changing the map of dentistry just like they are changing the map of Austria. Have you looked over that map of Austria? There isn't any Austria left you might say, and there is not going to be any of this display of old dead teeth in the anterior part of the mouth in a short time.

DR. HUNT: I was not expecting to discuss this paper. However, I want to say, with Dr. Sherraden, that I do not remember of ever listening to a better demonstration or lecture on porcelain than the one we have listened to today. Not only that, the technic is very complete. I don't know that there is very much to say except to ask you to think how important the porcelain is for our uses, even with artificial teeth, and the wonderful improvements that have been made in those teeth and the many ways in which porcelain can be handled. Now the greatest objection that was made to porcelain, and probably was a good one, was that it was not strong. Well it depends on where you put it and how it is used as to whether it is strong or not. Dr. Sherraden's illustration was a perfect one; also that shown by the lecturer is a perfect one. The principle behind it all is, that porcelain is strong when it is well embedded; when it is braced from below or rests upon good foundation it is not easily broken. And more than that if you try to break porcelain, some of the porcelain teeth perhaps to get the pins out or for any other reason, it will require considerably many blows of the hammer to break it, depending on just how you strike it. But when it is embedded in a good base firmly set, it is as strong as any other material that we use in the mouth. I hope to see the day when the technic and the management and the use of porcelain will be improved so that we can use it to a greater extent than we do now. It certainly is a decided advantage to use these jacket crowns. A good many years ago when Dr. Lane first brought notice to the profession of the making of the jacket crown, I had occasion to put on two of them in one mouth in lateral incisors, and I only need to say that, twenty years after both were doing good service and looking well. Now at that time I did not know, and even now I do not know, of anything that would restore those teeth as well as the jacket crown. They were not made like these either, not as good as these by any means, but yet as I say twenty years after I saw them both and they were doing good service. So that it simply demonstrates the point that porcelain in its proper place is strong and durable, and there are cases like that of diseased teeth, Hutchinson teeth sometimes they are called, that are amenable to a jacket crown. Though destroying the pulp, the cutting away of the tooth to make room for the crown is not sufficient to do it any particular injury. Now the question of color. I was pretty well acquainted with Dr. Brewster, who is probably one of the best porcelain workers that we have ever had in this country, and the method of making the Ash tooth for instance, is by pouring in a mold much as the Doctor showed you tonight; while the method of the American made tooth is entirely different. A core is made first, and over that the enamel is made, endeavoring to imitate the structure of the tooth in the mouth in making the tooth; but the English tooth is not made in that way at all. It was poured with different shades into the molds beginning with a certain shade at the cervical portion and then graduating it down to the occlusal end, and I asked him to show me how they avoided mixing those colors; that is how they got a blend of one shade into the other without a clear line of demarcation. "Well," he said, "that takes a long time and experience to manage that." He said, "the important feature about it is the consistency in which your mixture is, the first that is used; then the next should be just slightly thinner than that that you have already put in the mold, and the mold should be jarred constantly or kept in motion and that is finally added to, little by little, and the jarring is slight and yet enough so that those shades commingle and blend together without showing a clear line of demarcation. And just think, they made those teeth in molds mixing a number of teeth at the same time, but it is a matter of experience and a matter of skill, and in that manner all the different shades, beginning at the cervical margin and running to the occlusal end, are blended; you may use three or four with care and different consistency in the use of the mix. Those can be brought together so that they blend and show the different shades without showing each distinctly." I don't know that I have very much more to say except that I am decidedly in favor of porcelain wherever it can be used. The inlay work was spoken of. I think the reason that went out was more particularly due to the fact that while sometimes, perhaps nearly always, in getting the inlay to place, it looked well, it did not show the line of the joint between the natural tooth and the inlay, but of course in time that line would show very distinctly, and it became more or less unsightly and in many of the restorations the porcelain would not be strong enough, not having enough base underneath it. I think those are the two reasons why the porcelain inlay has gone out of use more particularly.

DR. DUNHAM: In casting around for a man to speak on this subject I want to tell you men how I came to run across Dr. Vehe. Two years ago this summer I had the pleasure of spending four days in his office watching him work and asking questions and I think I got something in that way. I think you ought to be able to get it; you ought to get it that way; I did. It is just one grand surprise from morning till night. And don't for anything miss the table clinic that we are going to get him to put on in the morning, to see the manipulation of that material. Dr. Vehe has given us just a taste of what he has; so don't miss the clinic in the morning.

DR. SHANNON: I want to say, Dr. Hunt, that I have set a few inlays with synthetic porcelain and have been agreeably surprised to find that that discoloration which we used to get with the oxyphosphate cement was not present after some little time; it seemed to stand better than cement, don't discolor and has not discolored in cases as is done with cement. It seems that you must have a retentive form to your cavity while in the days when I started in porcelain they taught us that a saucer-shaped cavity was all that would stand, and there are some folks setting those saucer-shaped cavities today, after eighteen years. With our present technic and knowledge which we have gained from the handling of gold inlays by the indirect method, I have found that it is possible for us to make retentive from of our cavities and get our inlays in, burnish the matrix to place and make a porcelain inlay so that it has a retentive form the same as the gold inlay has a retentive form. In the early days it was very difficult to get a retaining form and burnish the matrix to place. While the doctor does not approve of swedging, still you can do your burnishing later on, and you can very materially assist the burnishing by the swedging in the indirect method.

DR. DAVIS: I believe Dr. Vance had both his laterals put in in 1906, by Dr. Jackson, of Chicago. They are fifteen years old and nobody knows that they are there today.

THE PRESIDENT: I believe that is a secret. I did not know that myself. I have seen him several times a year, and I didn't know it. Dr. Vehe, we are certainly more than pleased to have heard your lecture. We all feel that way and I am going to ask you to close this discussion now.

DR. VEHE: The hour is late and in looking over the room, I see that those who are here have waited for my talk, you have waited for the discussion and you are now waiting for my *closing*. I want to compliment you and at the same time I want to thank you for it. It assures me that you are all interested in this fascinating subject. I say fascinating subject because your president, Dr. Baird, used that term in speaking of it also; I want to assure you that the more deeply I become interested in the subject, the more fascinating it becomes to me.

There are a few things that I have necessarily neglected to give you as thoroughly as I wanted to, but it was partially due to an oversight or that I expected that you were getting it a little differently from what I thought. One of these things, which I touched upon lightly in my paper, was the problem of the prevention of fracture. We, of course, know that porcelain has friability, that it will fracture and we cannot help it. We give it the proper condensation in building, we give it the proper fusing, we set it rightly and then what else can we do to prevent fracture? Merely this: The operation done with porcelain is and should be no different from any other restoration in the mouth when it comes to articulation. Your restoration, whether it be an anterior crown, a bicuspid or molar crown, should have the proper contact that you insist on in any other operation and you can get it just as accurately. It should have the correct anatomy that, I think I emphasized three or four times tonight, and I am going to emphasize it just as often again before I get through, and it should have that articulation that you are able to give it, and you must give it in order to have the result that you want with this crown. If you give it the right articulation, in other words if you have it articulate as accurately as any other area in the mouth, as far as fracture is concerned, I don't think you have to worry about it. But if your articulation is not right, in other words if it strikes more firmly or more severely on that area or that tooth than any other area, then be careful for then you may expect something. It was said that I might have something more to say about the color. Dr. Sherraden made that statement, I think. Possibly I might have, but it is a very difficult matter to treat and convey to you just what I mean. I am glad indeed that he stated a little later on, that it is something that cannot very well be brought to you by word of mouth so that you can get it and that is right. But I want to leave these ideas with you that you should first of all study the theory of color—the Helmholtz theory; that you should study the effect of light on the different surfaces. Now that is only a start. Familiarize yourself with those. Experience will help you to understand and to be able to recognize these finer gradations of color; in other words you will recognize a hue. There is no difficulty about that but the exact shade or tint of that hue is what you are going to have your difficulty with. I cannot tell you. You have got to learn that. Experience will give it to you and if you are color-blind to one or the other of those colors, you may never get it, or you will never get it. Dr. Sherraden stated he believed I used a good many colors; on the contrary, Dr. Sherraden, I use very few colors in mixing. I believe that for the ordinary cases, and by that I mean possibly ninety per cent. of my cases, six or eight different colors is all I have to use to get the results that I want. Then if you want a certain peculiar coloring you can use the color that you have at hand, or you can resort to stains by using them rightly and get the effects that you want. Regarding the mixing of colors we are told that you should use an agate mortar and pestle and mix them in that way. I am here to confess to you that I don't do it; I do, however, weigh my colors. For instance, we say that we want a certain portion, for instance, one part of one color and we want to dilute that with a lighter tint of the same hue, and we want three parts of that lighter coloring to dilute that to the proper hue. I weigh out one portion, for instance say three grains of the one color and nine grains of the other color. It shows you how accurately we measure out the colors to get what we want. I weigh them out and then mix them up on my slab. I do not resort to the agate mortar and pestle; I think they are all right theoretically. I mix them up and I think I have gotten the colors I want in most cases in my own way. I think Dr. Sherraden stated that I objected to swedging; I do not. I think it is a splendid way of adapting the matrix, but in my own hands, I do not think that I need to do that because I believe that I am accurate in my burnishing. The subject of synthetic porcelain: I don't know that that is timely because I don't think that much need be said about it. That is not my subject but I will say this: Porcelain inlays have been set with synthetic porcelain and have given good results. I agree with that and the operations are more beautiful; no question about that; and as long as you use it in cavities where you can anchor by undercuts there is nothing better to use if properly mixed, and sometimes I do that because I get better color and the line that we spoke of is eliminated. I have had some set for five years or more, and they are still as nice today as when I set them. We have found this, that the synthetic wherever used most firmly sticks to the porcelain but is not attached to the tooth at all firmly. Now why? I don't know. Now, gentlemen, in my talk tonight, I gave this very didactically. I do not know that I have gotten as close to you as I wanted to. I wanted to make the talk as plain as possible, and as simple as possible so that I could give you what I had to say and have you get it. Now tomorrow morning in my clinic I want to, and I hope to, get closer to you. I want to get in a heart-to-heart talk with you and we will talk this matter over. I will go through the building of the crowns with you as carefully as I can, showing you the preparation first, and the building of it and so forth, and in that way I hope to show you just what I want to leave with you. Before I close tonight I just want to emphasize again, that those of you who have done porcelain work of course need not be convinced about the beauty of it. Dr. Sherraden made a statement I liked very much about the younger men getting into the work. You most assuredly do well to encourage them, because I believe this: There is a definite place for it in the handling of our cases and in your treatment of patients, and unless we use these methods of treating them we are not doing our full duty with them, we are not giving them what we would if we understood it and were ourselves in the very same place. The possibilities so far as form and color are concerned you can see are in your own hands. Give up the time to develop that and work it out and do something with it. Now, gentlemen, I think so far, that the porcelain jacket crown is placed on a very high plane. You are expected to give true anatomy and true color. Let us keep it there. Let us not bring it down to some of the other things that we see in our profession, or at least that we have seen more than we are seeing today. Gentlemen, I thank you.

FUND FOR THE RELIEF OF FRENCH AND BELGIAN DENTISTS

At the request of President Beach, I am sending you a list of the contributions received since our last publication in your magazine:

South Dakota State Dental Society, $50.00; Georgia State Dental Society, $130.00; Dr. Hector G. Marlatt, $5.00; Miss Mary Daly, $1.00; Warren County Dental Association, $10.00

On December the 31st, 1919, we also sent a draft to the committee in France for $2000.

L. M. WAUGH, *Treasurer.*

THE MENTAL VERSUS THE INSTRUMENTAL PROBLEM OF ARTICULATION*

DAYTON D. CAMPBELL, D.D.S., KANSAS CITY, MO.

AT THE RECENT INITIAL MEETING in New Orleans of the National Society of Denture Prosthetists, the Honorary President, Dr. George Henry Wilson, very happily expressed the problem of articulation as "mental rather than instrumental." Just as the farmer lad, who knows the haunts and understands the habits of the fishes, can take a bent pin and a willow pole and bring home a longer string of beauties than the city sport with his hook of flies and split bamboo, so may a dentist, who is versed in the anatomical relationship of the teeth in the opposing jaws and who is fully acquainted with the physical laws involved in retaining removable bases in the mouth, be confidently expected to construct on a barn-door hinge dentures that will more efficiently perform the function of mastication than will dentures constructed by an operator unfamiliar with the essentials of articulation, even though he uses the best articulator to be obtained.

Unless readers of this article have kept themselves informed with respect to the remarkable advances that have been made in recent months along prosthetic lines, this presentation of the problem of articulation will contain little to interest them. Unless thus informed, they will continue to emphasize the mechanical aspect of articulation and will construct articulators while talking about essentials and about basic principles and will continue to use similar expressions, when it is evident to many that the principles which they mention as "basic" are almost as far removed from the fundamentals of denture construction as the decorations of the Corinthian column are distant from the base upon which it rests.

The articulation problem is approached today and its solution attempted in two ways, diametrically opposed. One of these ways is an attempt to preserve unbroken the apostolic line of succession from Bonwill with his geometrical ideals and mathematical calculations, down the decades to those who have devised elaborate mechanisms for measuring movements of the condyle and reproducing these in the process of constructing artificial dentures. From the writer's viewpoint, studies of habitual movements of a jaw and tracings of its condyle paths as an aid in the construction of artificial dentures are obsolete, and the writer confidently believes that the date is not far distant when talk about condyle paths and their measurements will receive about the same treatment from prosthetists as the Ptolemaic theory of the universe receives in modern astronomical circles, and advocates will meet with the same kind of reception as is now accorded teachers who hold that the sun revolves about the earth, or who contend that the earth is flat.

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*The second of a series of articles written for DENTAL SUMMARY readers.

The second way of solving the problem of articulation is through a study of the forces of occlusion, the ligamentus limitations that obtain together with the musculature involved. This solution demands a construction of artificial dentures according to the basic principle that the tactile sense of the tooth cusp is the guiding factor in movements of the mandible.

In keeping with this second method of approach towards a solution of the problem, significant studies in limitations imposed by the ligaments of the jaw have been made, among others by Dr. Martin Dewey, of Chicago, and Dr. George Henry Wilson, of Cleveland. It was Dr. Dewey who first called the writer's attention to the fact that prosthetists had not made use of the guiding factor of the tooth cusps, a factor so obviously employed in nature's plans. The phrase, "the tactile sense of the teeth is the controlling influence of movements of the mandible," belongs to Dr. Wilson and appears for the first time in dental literature in an article from his pen in the March number of THE DENTAL SUMMARY, 1916.

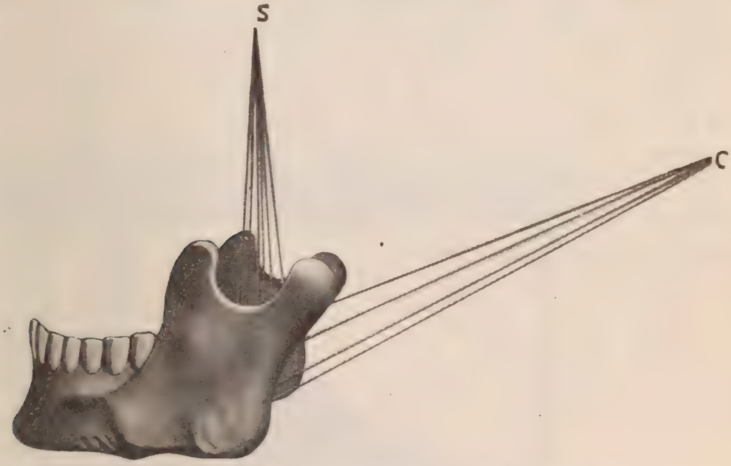

Fig 1.—Schematic model of ligaments theoretically extended to cross at imaginary points "C" and "S", which inventors have incorporated in the construction of articulators.

The writer has in different connections called attention to the importance of these ligaments, and he now emphasizes the fact that during the construction of an articulator the true function of the ligaments must be kept in mind. Accordingly, with this in mind, an efficient articulator is possible if it affords merely a frame to serve as supports for the casts, and provides a universal joint, together with some device to assure a return of the movements to their starting point, or to meniscus occlusion.

Figure 1 presents the spheno-mandibular, the capsular and the stylo-mandibular ligaments in a schematic model used by the writer on a previous occasion. The sole service of the ligaments is to limit the extent of mandibular movements. In this figure the mandible is shown protruded to the farthest limit. If these ligaments were extended imaginatively they might cross at "C" which would be found near the occipital protuberance. If they were extended vertically in similar imaginative fashion they would serve a similar purpose; in fact their extension to any point on an imaginary line connecting "C" and "S" would be just as acceptable. We might also use these points and the lines representing the ligaments to assist us in the erection of triangles and in the construction of cones and spheres and other geometrical figures, but such figures are not vital considerations in the construction of articulators; it is not essential that centers of movement have any anatomical or geometrical land mark. These theoretical extensions and geometrical constructions have been made by inventors who have incorporated these points as part of a universal joint supplied by them in their articulators. Dr. Wilson recently has emphasized the function of the ligaments or, perhaps better, has more thoroughly disposed of erroneous views concerning them, through inverting a skull and graphically showing that in the movements of the triturating and masticating process the ligaments are not at all concerned except to keep the jaw from going beyond bounds.

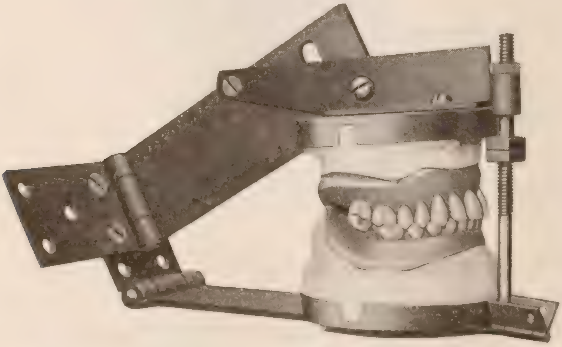

Fig. 2.—A crude articulator constructed of two barn-door hinges, bottoms of two flasks, and using cabinet-door hinge for guide cup and a bolt for guide pin. Equals in function the most expensive.

Figure 2 shows a crude articulator which has been constructed of two barn-door hinges and the bottom parts of two flasks, using a small cabinet-door hinge for a guide cup and a bolt for a guide pin. It affords both the required universal movements and a return to central or meniscus occlusion; it is equal in function to the most expensive articulator.

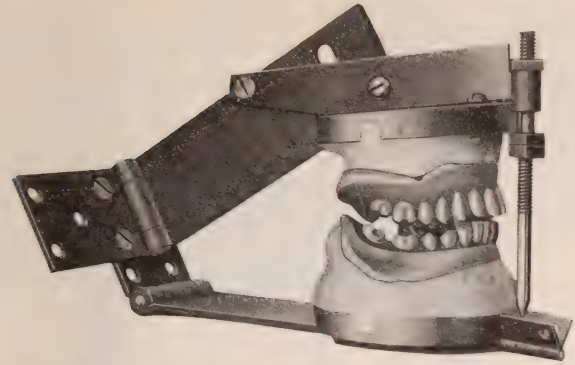

Fig. 3.—Showing same articulator as Fig. 2, but showing lateral movement affording desired contact.

Figure 3 shows the lateral movement which permits the desired two points of contact between upper and lower and allows space for the bolus of food.

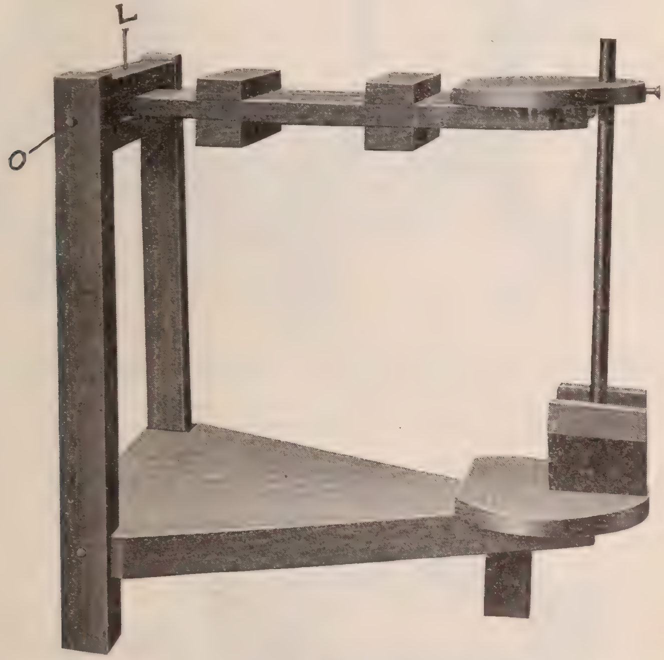

Fig. 4.—An articulator of very simple construction which provides the "universal joint" through a lateral movement at "L" and opening and shutting movement at "O."

Figure 4 is a picture of an articulator which provides the same features as noted above, but in which the "universal joint" is supplied in a slightly different mechanism. *Figure 5* indicates the lateral movement possible and also that the desired relationship between the teeth in opposing bases may be obtained.

Figures 6, 7 and 8 present the Hall articulator, which is representative of the "cone" ideal. *Figures 9 and 10,* show the Monson articulator constructed by an exponent of the "sphere" relationships.

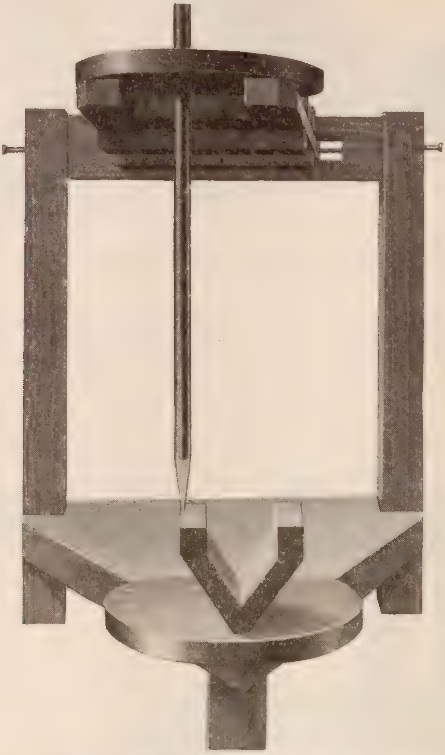

Fig. 5.—This figure shows the lateral movement of the articulator shown in Fig. 4.

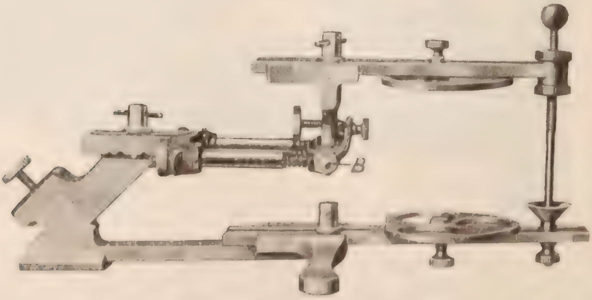

Fig. 6.—The original Hall articulator. In mounting casts, a face bow was used; when mounted, calipers were used to assure that the *distance from guide pin to point "B"* ("B" lying in a common base of two Bonwill triangles) was preserved in the distance from "B" to rotation point of articulator. This was in accordance with the idea that two Bonwill triangles placed base to base would furnish an ideal rotation point, the guide cup being placed at the apex of one triangle while the rotation point is placed at the apex of the other.

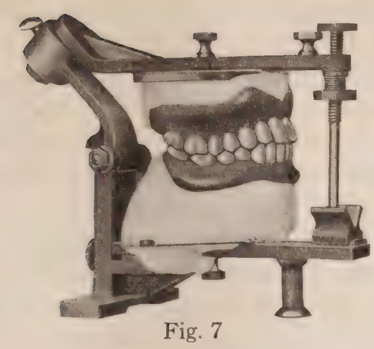

Fig. 7

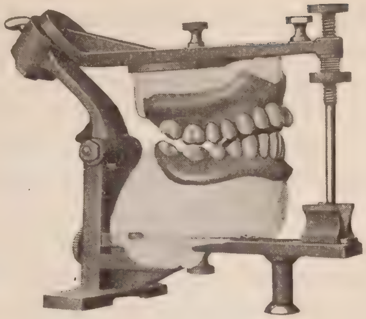

Fig. 8

Fig. 7.—A later Hall articulator.

Fig. 8.—The Hall articulator showing lateral movement and two-point contact, together with the space providing for the bolus of food (or third point of contact.)

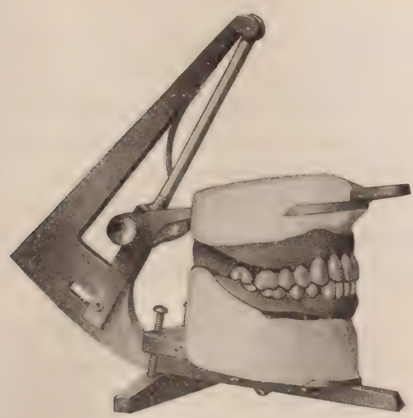

Fig. 9

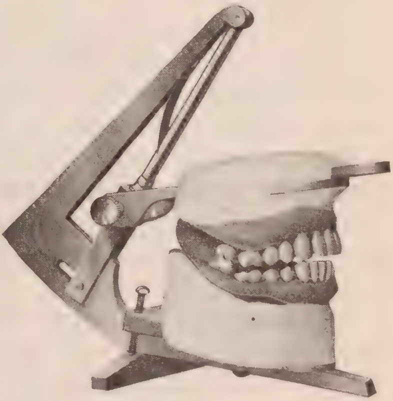

Fig. 10

Fig. 9.—The Monson "Mandibulo-Maxillary Instrument," mounted with dentures constructed on the Hall "Automatic Anatomical Articulator," and working with equal facility. The reverse is equally true; this is practical corroboration of the statement that "the tactile sense of the inclined planes of the cusps is the guiding factor in movements of the mandible."

Fig. 10.—The Monson articulator showing lateral movement and two-point contact, together with space providing for the bolus of food (or third point of contact.)

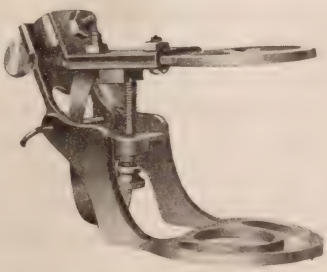

Fig. 11.—A plain line articulator to which Dr. J. S. Letord has contributed a universal joint and a guide cup.

Figure 11 is another type of articulator providing a universal joint. It is a plain line articulator improved by Dr. J. S. Letord, of Kansas City, so as to add some very desirable features when used in automatically grinding the teeth after completion.

Anatomically, Dr. Gysi was correct in his location of the rotation points. At least this is the writer's belief. But whether this location is correct or not, the writer wishes to point out that the location of the rotation point is practically immaterial. The practical consideration of importance is found in the fact that in the masticatory excursions of the lower jaw, its direction is not primarily affected by any much-discussed rotation center but is wholly dependent upon the relationship of the opposing cusps. This is explained through the fact that the synchronized inclined planes of the tooth cusps sliding upon the opposing tooth cusps constitute the determining factor in directing mandibular movements.

In the construction of articulators, some inventors have grown very enthusiastic over the results that they have obtained and have mounted casts of natural teeth upon their articulators in order to show the peculiar merits of their inventions. In their enthusiasm over their creations many of these inventors have failed to see that their casts come to central occlusion through following their cusp inclinations, and not through any virtue of the peculiar mechanism of the frame in which they are held—other than by virtue of the universal joint movements which the mechanism provides.

The simple devices whose illustrations appear in connection with this article are in keeping with the whole purpose of the article, namely, to remove as far as possible the veil of mystery which for some has enshrouded the problem of articulation. It may be in keeping also to observe that the poorest form of articulator is the one that permits the least movement. A step away from the poorest form, i. e. a step away from the "plain line" articulator, is a plain line articulator in which a pin of smaller diameter is substituted for the hinge pin that was in the articulator while the teeth were being set up; this substitution permits some movement, the direction of which is limited but not determined. The writer got this idea several years ago from Dr. Green, who through this substitution was enabled to use the plain line instead of an anatomical articulator. Then follows in the history of articulators a succession of eight or ten instruments varying in shape of condyles and in latitude of movements, besides improvements and attachments for these which have been supplied by others than the original inventors, culminating, so far as the author is aware, in the ball-bearing "wear-compensating" improvements which Dr. M. M. House, of Indianapolis, has added to the Hall articulator.

A cheap articulator is indispensable to furthering the general solution of the problem of articulation. It has been the writer's experience, that for any efficient mechanical apparatus there will be a great many capable prospective users—provided the experiments incident to becoming acquainted with its seeming mysteries require but little additional expense. On this account the writer stresses the fact that the item of expense will be a factor worthy of consideration in any serious attempt to make the solution of the problem available to the profession in a general way.

It may simplify the discussion of the relationship of the instrument to the achievement at which the prosthetist aims, if we observe that, while the articulator with universal joint movements may lend itself to splendid advantage in demonstrating how it permits the cusps of the teeth to follow the cusp paths arbitrarily determined by the dentist, just as they follow in the human jaw the cusp paths determined by nature, this kind of articulator is not indispensable in the construction or set-up of artificial dentures. As we have just suggested this is true because the operator determines the cusp path of the artificial teeth. He does this by his use of the guide-cup. The angle of the guide-cup will depend upon the operator's judgment as to whether the individual case requires sharp deep cusps or whether it requires those which more closely simulate the results of wear. The case with sharp deep cusps gives more spectacular effects and consequently this kind is almost invariably chosen for demonstrating purposes.

Then, too, it may be observed that the lateral movements of articulators which permit a lateral movement are seldom employed until the teeth have been placed upon the bases so as to bear the proper relation to the antagonizing teeth and to the ridges.

The lateral movement is employed, after the teeth are in position, to secure such balancing contact as the operator may regard as essential. The balancing contact often regarded by the operator as essential is the "three-point contact." This means that the teeth are set up so that when moved to either side the upper will take a position upon the lower after the fashion of a three-legged milk stool on a barn floor. Just why dentists have grasped this phrase so eagerly and still cling so tenaciously to "three-point contact" it is difficult to say, but it may be that this is regarded by some as a later degree which they must take after they have been initiated into the mysteries of Bonwill's geometrical deductions and assumptions. The possibility that the third point of contact may disappear from the direct relationship of the opposing jaws, as soon as the teeth are engaged in performing their masticatory function, has puzzled many investigating dentists from the start. It is only recently that emphasis has been given to the fact that not only the third point but all points of direct contact are lost when a morsel of food is engaged, unless the teeth are set up to a deep over-bite and provided with two points of direct contact which allow for a third point of indirect contact where the food awaiting comminution keeps the contact from being direct. This is distinctly a Hall innovation.

It might not be advisable to permit too early the students in our dental colleges to learn that the balancing contact theory is mostly theory, because as a pedagogic aid such a goal helps to direct attention to proper anatomical articulation.

In the same manner that an idea or a theory is a great mental help at certain stages on the way to secure proper articulation, so the instrumental aid must be an aid to this same end. It must enable the operator to move the artificial mandible to correspond with the opening and shutting movements of the jaw; it must permit a lateral or triturating movement of the jaw (which is very slight); and, finally, it must provide a protusive movement to obtain an incisive action of the jaws. This protusive-incisive or prehensile movement has been a possible movement in different articulators including the Gysi, but no distinct use was made of it. Even in the case of the Gysi articulator this prehensile feature seems not to have been in the inventor's mind. So far as anything that has come to the writer's attention, nothing in conversation with Dr. Gysi or in his articles, has intimated that such a movement had any significance. This applies as well to Dr. Gysi's disciples in this country—nothing in their conversations or articles, and none of the teeth set up by them has indicated that this movement was important. Dr. Hall says that the importance of this prehensile movement was first brought to his attention by one of his friends at the Rochester meeting in 1913. This feature was immediately incorporated in his articulator and it has since received a great deal of emphasis both from him and from other prosthetists. It is easy to see that this movement provides the "shearing" action which is indispensable to an efficient masticatory aid.

In order to make the shearing action most effective, the artificial teeth must be set up with a deep over-bite and the teeth then ground automatically so that at every conceivable stage of the retrusive movement this shearing edge is balanced and free to function unhindered by irregularities of the path along which it must travel. Nature is not interested in this balancing because there is no danger of unseating the rest of the teeth, as there is in the case of artificial dentures when proper provision for this balancing is not made. However, even in nature, after the cusp paths and harmonious relationship preserved in the gliding movement have been long established, decay or extraction may permit a misalignment and thus furnish an obstacle in the path of this previously beautifully coordinated mechanism. It is obvious that every motion of the jaw in masticatory effort will bring to bear the full force of mastication against this particular hindering tooth. This continued trauma will produce irritation which, according to Dr. Geo. S. Monson, of St. Paul, is one of the most potent factors in producing so-called pyorrhea alveolaris.

The balancing is assured through proper inclination of the second molars, a phase of articulation first presented by Dr. Wilson. This tipping of the second molars leaves spaces between the teeth, because the teeth are ordinarily manufactured to set on a line and consequently when set on a curve these spaces must result.

The scheme for setting up the teeth, has, in our judgment, been stated most clearly by Dr. Gysi. Since his clear statement was given to the profession, the scheme of course has been modified and exaggerated, but we are safe in saying that these changes are modifications or exaggerations of his plan, which for the physicist conforms to physical laws so adequately that no other alignment is permitted.

We may well call attention to the fact that this scheme of Dr. Gysi's fails, or that any other scheme of setting up the teeth must fail to give definite instructions for determining the proper position of the six anteriors. The position of these will be determined or influenced by such widely varying factors as the personal equation of the operator, his sense of the esthetic, and particularly his convincing suggestion to his patient that the selection and arrangement adopted tentatively are the best suited to their environment. The writer will present this last phase at greater length in a subsequent article. Owing to the factors determining their proper position, the writer for a number of years has strongly advocated and practiced the arranging of the six anterior teeth before the bite is taken. This method eliminates subsequent alteration even though the bite be incorrect.

Since the basic principle of articulation demands that we observe the tactile sense of the tooth cusp as the guiding factor in movements of the mandible, the writer submits the following as the basic principle in the construction of articulators:

Articulators should be constructed to facilitate the *production of dentures* the tooth cusps of which will enable the mandible to move most effciently in the process of mastication. This reverses the principle which generally has been followed, namely, that articulators should be constructed to *reproduce movements of the mandible.*

This principle may be illuminated by the observation that the mandible of an edentulous mouth has no certain movement which needs to be reproduced; but this mandible, when supplied with efficient dentures will find all necessary masticatory movements already "routed" via the cusps of the artificial teeth. An attempted definite "routing" through measurements, or tracings, or deductions from hypothetical triangles before the operator begins to set up the teeth, is premature, and when accomplished is superfluous—to say nothing of the useless anxiety involved in the attempt.

EDITOR'S NOTE: Discussion of the principles, or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

THE SALVAGE OF PULPLESS TEETH*

BY W. CLYDE DAVIS, B.SC., MD., D.D.S., LINCOLN, NEBRASKA

THE DENTAL PROFESSION so long has applied the terms "dead tooth" and "non-vital tooth" to teeth which have lost their pulps that it is hard to change and think in different terms. We are now confronted with important subjects the consideration of which forces us to correct our terms.

A tooth is vital in proportion to the vitality of its cementum, as evidenced by the attachment of the peridental membrane. A tooth may be non-vital or dying in proportion to *this* vitality, and it may be either vital or non-vital with or without its pulp. The whole consideration of this subject involves the facts pertaining to the vitality of the cementum and the presence or absence of infection. In one of his recent articles Dr. Arthur Black, of Chicago, takes a similar position. All vital teeth, (that is, teeth whose cementum is vital and therefore attached to peridental membrane), are capable of retention in proportion to the possibility of maintaining that vitality. The presence or absence of a vital pulp has little to do with the case. Again, teeth that are non-vital as evidenced by the loss of the vitality of their cementum are not capable of salvage, and those which are dying, wherein the cementum is undergoing a progressive dissolution, are in great danger of being lost, as it is not always possible to prevent the continuation of this dissolution, the presence or absence of a vital pulp being only a collateral consideration.

If you will stop to think, we have all seen dying teeth that were nearly dead; that is, with the cementum nearly all dead, and yet with a very vital pulp. On the other hand, we see pulpless teeth where the cementum is all vital, still firm and solid, wherein no pathological lesion can be detected. If you will examine the tusks of a young elephant you will find the formative organ, the pulp, nearly to its end. Then examine the tusk of an old elephant. It has no pulp at all. It is attached by its cementum at the root. No anatomist, physiologist or pathologist would term the tusk of the old elephant as a dead or non-vital tusk. The distinction I am making between non-vital teeth and pulpless teeth is in full accord with medical usages of those terms with reference to the bones in bone surgery. The bone is not dead while it has a complete attachment to its vital periosteum. It begins to die in locations where it begins to lose this attachment and the bone is non-vital only when the attachment is completely lost. It may lose a portion of its attachment when the attachment is completely lost. It may lose a portion of its attachment when a sequestrum will form which must be lost, either by surgery or due process of exfoliation. A femur may lose its marrow and yet not be classified as non-vital, as this may be regenerated. The loss of the marrow of a femur is more serious than the loss of the pulp of a tooth. In both instances they assist in the formation of some part of the hard tissues. In the adult tooth the pulp is nearly functionless, while with the case of the femur the marrow still assists in the vital processes. It is therefore more reasonable to call a femur a non-vital femur that it is to call a pulpless tooth a non-vital tooth. We will therefore consider this subject with this definition and understanding before you.

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*Read before the Southwestern District Dental Society of Nebraska, September 15th, 1919, and the Northwestern, October 16th, 1919.

For a period just previous to four or five years ago, many of the prominent teachers in America were calling the attention of the profession to a need of regeneration in our methods of root-canal treatment, particularly the so called permanent filling. This call for a change was brought about by a growing knowledge of the dangers of the presence of focal infection in any part of the body, particularly about the teeth. The preaching by the teachers at first received little attention; in fact dentists were only slightly interested, until a noted physician made some very startling statements relative to this subject. These statements rapidly got into the public prints, both professional and secular, with the result that a majority of both the dental and medical professions took an abrupt and sudden notice of the call. Prior to this time most of the members of both professions were in a measure antagonistic to the then new theory, but like a flock of sheep, after one or two of the band had jumped over the fence, the remaining thousands almost tore down the fence in the effort to get on the other side. Therefore, at the present time we find ourselves in a position something like this: A few dentists refuse to take any stock in the theory of focal infection. Others accept the theory and believe *some* attention should be paid to the teachings of our investigators. Others have gone at the subject in a painstaking way and are endeavoring to improve their methods and if possible save the teeth of their patients from destruction, in a manner which is not inimical to their patient's health.

There is yet another faction in the profession, which I am sorry to say is altogether too large. They have accepted the idea without investigation, given up all effort to save the teeth and declared that all pulpless teeth should be extracted. Among these we find the man who has suddenly come to the conclusion that he was priorly intended for an extracting specialist. Oral surgeons generally need take no offense. The writer is one. This last class is made up of quite a number of subdivisions. There is the man who is devoid of scruples and conceives the idea that it is now possible to influence the public to the surgical operation of having most, if not all, of the teeth removed, as they easily can see the monetary value in being on the side of a going game. Then there are others who are simply lazy and do not care to give the subject enough thought and investigation to properly fit them to deal with this focal infection problem, other than by the easy way of extracting. There are yet others who to themselves admit their shortcomings and conclude that it is not possible for them to develope a sufficient amount of skill to do a correct and scientific operation of root-canal treatment and filling. For these and many other reasons the public is at the present time losing hundreds of thousands of teeth, which could be saved by an educated, painstaking dentist. It is with the desire of assisting my colaborers in stopping this ruthless slaughter of the masticating organs that I am appearing before you today.

Dentistry grew from nothing into a profession in less than sixty years. Within the last few years, five or six we would say, dentistry has grown in importance from a profession, thinking only of saving the masticating organs, to a profession which deals with problems in the mouth and about the teeth which have a vital bearing upon the health, life and happiness of every person who comes in contact with his dentist. It has therefore changed from a profession of passing importance to one where the problems and thoughts connected therewith are of a serious nature; and to the degree in which these things have become serious, to that same degree should the dentist regard the problems which present and avoid their careless solution.

The position that all pulpless teeth are detrimental to health is just as untenable as is the psoition formerly taken by many, that the focal infection theory was a hoax. The whole question resolves itself into the personal equation. There are dentists sufficiently skilled that very few cases they attempt become infected, and of those which come to them infected they are able to remove the infection from a large per cent. This percentage of salvage on the part of the dentist may be regarded as growing less and less until I am convinced that we have dentists who never should attempt the entering of a pulp canal for treatment with any kind of an instrument. Then on the other hand we have patients *and* patients. We have those who *can afford* to pay the dentist for the necessary time. It takes longer to do a good root-canal operation than it does to do an operation for appendicitis, and many times the patient's life is in jeopardy just as much with one as the other. We have those who *cannot* afford to pay for any great part of this work. The last class must choose between the loss of their teeth or their health.

Then we have cases presented wherein it is a question of time. The patient has become sensitized to the particular strain of infection present and is feeling the results in the manifestation of a general disturbance. This general disturbance may be of a nature which permits days, weeks and even months in eliminating the infection, whereas, on the other hand, it may be of a dangerous and violent nature, so that the patient's life is in danger in waiting but a few hours. Then again we have patients who have local and radiographic manifestations which diagnose mouth infections and yet these very infections are (as in the case of young patients) many times developing immunities from these various strains of streptococcal infection, and it is hardly saying too much to say that in that particular case the infection is proving a benefit. To illustrate, we purposely infect our patients with the germs of typhoid, diphtheritic, tetanus and other diseases to develope immunities. It is not a safe doctrine to preach that because one carries focal infection about a tooth with no seemingly bad results that he should *continue to carry* that infection, because the infection is being absorbed and thereby unscientifically administered. The infection should be removed, but this does not always mean extraction.

With the facts of recent research before us we are forced to conclude that the practice of dentistry as regarding this subject as completely changed. It has come about that the dentist is now like the family physician. He must take each individual case, study the conditions of the patient with reference to the possibility of each individual tooth; he must consider the health of his patient with reference to present conditions and future possibilities and probabilities, and lastly he must not forget his *ownself*, with reference to what it is possible for him to do, taking into due consideration, his own shortcomings, *then advise* and act accordingly. The lazy man, or the coward, or the man who secretly knows he is a failure in root-canal work, is sure to end up an extracting specialist, for, as you know, "dead men tell no tales."

Dentistry has suddenly come before the public much in the same position as the medical profession. The all-around dentist is like the family physician; he has a general survey of the field. He may decide that he cannot save a certain case without surgery. It is professional and perfectly proper for him to attempt the surgery himself if he feels so inclined, or he may recommend his patient to the dental surgeon for extraction and curettement. The extracting specialist is like the M.D., who makes surgery a specialty. It is perfectly within *his* province to diagnose each case, and if he does not care to treat the case, refer the patients to their family dentist where a proper root-canal filling may remove the infection and save both tooth and patient from further trouble. But let us hope that the general surgeon is no more anxious to make a surgical case out of any particular patient, than is the family physician; and let us hope that the dental surgeon, or extracting specialist, is no more anxious to make a surgical case out of this particular patient than this patient's family dentist. If this honest and honorable professional view is taken of the subject I feel that more teeth would be saved for our patients.

When I was a medical student we were just in the era of gynecological surgery when they amputated and burned the cervix uteri for all kinds of ailments, mainly nervous diseases, and I refer to the operation upon normal tissues. This fad passed away, and we soon found the medical profession in a much more serious assault on womankind, as this was the detestable period of ovariotomy, when literally bushels of normal ovaries were gathered in by the industrious surgeons. Many have lived to bitterly regret that time, as scientific consideration has proven the error. The only benefit that has been reached from this fad has been the removal of the permanently-diseased ovaries.

Following this we came to the appendicitis era, and I am sorry to say there are a few of the faddists of that era still with us. It was a time when if a medical man asserted to a surgeon that there was a doubt in his mind whether an immediate incision should be made in the iliac fossa and the appendix taken out (because that patient had more or less severe stomach ache), he would have lain himself open to abuse. As with other fads this has largely gone and the removal of the appendix is regarded as a matter that should be weighed and considered carefully before operative interference even is suggested.

There was then ushered into the medical profession the fad of tonsillotomy and the patient who had run fast enough to escape the other three fads was forced to throw on high gear and take to the tall timber, if he was to save his tonsils. Anybody, everybody, young and old must be devoid of tonsils before the surgeon would give them a clean bill of health. I am glad to say that this fad has now passed and left with us a conservative consideration of these useful organs, so that unless destructive diseased conditions are diagnosed, the laity is allowed to carry their tonsils with them on the street and are not necessarily regarded as totally ignorant or foolhardy. In fact we have some specialists who have come to believe that slight infection of the tonsils, from time to time, may prove a benefit to the patient in the way of developing immunities. This brings us down to the present time; the fad of the reckless sacrifice of the dental organs.

It was not right to sacrifice the ovary unless there was good and sufficient reason. It was not so serious that people lost their appendices, except that some suffered from it physically and financially. With reference to the tonsils, it was *less* serious as the after effect of the loss of this organ was not so great, but the sacrifice of the teeth is a very serious offense, unless we can show some good reason for it. If some of the overly-enthusiastic had their way the human race would be edentulous creatures. After the eruption of the permanent teeth our work would soon be done.

Dr. Hartzell, in a paper in the September DENTAL SUMMARY, sounds a warning in this connection when he says: "The dental profession in years gone by has been chiefly engaged in conserving teeth without reference to or knowledge of the fact that in practicing this intensive conservation they are oftentimes doing a serious damage to the patient, illustrated by the old aphorism, 'Saving at the spigot, but losing at the bung.' Medicine, on the other hand, has been quick to grasp every new thought or theory for controlling disease. This was clearly evidenced when the profession accepted the erroneous statements made by Bass and Johns and Barrett and Smith that the amœba was the true cause of pyorrheal infection and that emetin was a sure cure for pyorrhea. It is not surprising, therefore, that there has sprung into being a great group of medical men and a few dentists, who, to control the death rate from mouth infection, vigorously assail the conservationist and ruthlessly sacrifice many valuable teeth.

"In view of the fact that the writer has contributed a large amount of the evidence upon which these destructive mouth infections have been brought to the attention of the medical and dental world, it would seem no more than fair that he should also strive to place before the medical and dental professions a true perspective from which to observe the problem which necessarily confronts every man practicing medicine and dentistry, as to what to do with diseased teeth, and under what conditions we are justified in removing necessary dental masticating organs, in order to prevent greater ills than those which arise from the lack of properly masticating our food."

Going back in some of our old dental literature we find references to cases wherein the general health had been materially benefited by the extraction of diseased teeth. We therefore, find that the idea of sacrificing diseased teeth for a general infection is more than a decade old. With these other fads, surgery has given way to medicine due to a better understanding of bacteriology, pathology, materia medica and therapeutics. As history repeats itself, so must this dental extraction fad give way to a cool and candid consideration of the conditions before us, and result in the adoption of methods which do not destroy the valuable human machine.

The crying need of the dental profession today is a better knowledge of these fundamental sciences. The dentist should be just as familiar with bacteriology, pathology, materia medica and therapeutics as his brother practitioner, the physician. It is upon this theory that your own University and many others are broadening the course of the dental student in these fields, with the idea that by thorough education we may be able to correct a great wrong being perpetrated upon the human race. The methods of successfully handling the oral infections, and I use the larger term, involve the consideration of a great many vital points. This requires a broad fundamental education.

The management of pulpless teeth involves the consideration of one class of the oral infections. It must be distinctly understood that the radiogram cannot prove the case and can only be a single link in the chain of evidence in any particular case. To successfully undertake the management of pulpless and non-vital teeth, the dentist must be prepared to go personally into the diagnosis of the case. The patient must be consulted and all the symptoms of which the patient is aware given.

The dentist should then have the clinical history of that particular tooth. He should apply the thermal tests. He should note the result of percussion. He should have a radiograph from at least three positions, that is; direct, posterior and anterior. He should aspirate and take a culture from the immediate region of the apex of each root of the tooth in question. He should take the blood count and in suspected cases make the Wasserman test. The blood pressure should be taken and deviation from normal noted. There should be a urinary analysis, and by the way, the graduates of both the medical and dental colleges in your University are given the necessary instruction. After this kind of an examination the best method to pursue may be intelligently decided upon. If the case is of such a nature we may decide to eliminate the infection by treatment. Dr. Ottolengui says in the September *Items of Interest*. "A careful study of apical infections beyond the canals, we think, will disclose that invariably such infection begins about some foramen that leads out of the pulp canal. The putrescent canal contents escape into surrounding tissues through a channel, and if such channels can be thoroughly sealed, the writer believes, until proof to the contrary is brought, that no amount of infection within the dentin itself can cause a disturbance beyond the confines of the canal. No one ever has shown a pericementum diseased from infection passing out through dentin itself. Its passage is invariably through a foramen. The crux of the whole situation seems to be to cleanse and sterilize as far as possible, of course; but final success or failure will depend upon the success or failure to thoroughly seal the foramen or foramina; single or multiple. A perfectly healthy root canal will in time become infected if the foramen be not perfectly closed, and even infected canals will be safe, if the foramen can be perfectly sealed."

Just at this point it may be of interest to inject a little personality into this paper by giving you the result of our work in the infirmary. During the past year we have carried about 240 cases through with a more or less complete preliminary investigation. We are happy to say, a large per cent. have proven successful. Those which did not prove a success and wherein we were forced to resort to surgery, have resulted in our greatest instruction. With these the size of the granuloma or the amount of infection present did not seem to have as much influence on salvage as did the fact whether or not the cementum of the tooth was attached to the living tissues and therefore vital. Those cases which did not seem to show a tissue regeneration, following treatment, were those that upon extracting or root resection disclosed the fact that the cementum was denuded and probably bathed in pus or a degenerated serum. This indication was so persistent that we have come to regard almost as a rule, the following: Teeth that are non-vital, that is, detached, or being progressively detached, cannot be saved from a recurrence of sepsis. The vitality or non-vitality of the pulp seems to be only a side issue.

Because the writer has not lent his influence in the past to the ruthless destruction of the organs of mastication by indiscriminate extraction, he has been accused of being an obstructionist. I wish to remove any doubt from your minds on this point.

During the process of treatment of the hundreds of cases in the infirmary, I have seen so many seemingly miraculous cures following the removal of the foci of infection about the teeth, that the danger resulting therefrom is thoroughly established in my mind. The treatment used has been in many instances other than surgical. You will pardon me if I emphasize these statements with the clinical history of two cases only.

Mr. "A" was referred to the writer for examination by a Lincoln eye specialist. The specialist stated that the patient was suffering from chronic retinitis, which, when settling down into the chronic state, resulted in two black spots the size of a dollar before the eyes. The specialist diagnosed the case as one of focal infection, and as all other sources had been exhausted he desired a report on the teeth. We gave the patient a thorough examination. The X-ray found a large granuloma on the second right superior bicuspid, attached to the apex. The tooth had an imperfect root filling, wherein the gutta-percha point came well short of the foramen. As it appeared that the cementum was probably not denuded and therefore vital, the writer suggested treatment, proving each step as we progressed. To make a long story short I can state to you that in two weeks from the examination, the black spots had left the eyes and vision became normal. Frequent examinations over a period of three months showed tissue regeneration complete about the apex of the tooth, and the eyesight remained normal; and here comes the most interesting part of this case: About six months after the restoration of the eyesight the patient returned with this statement: "Doctor, my blind spots have returned, but I have a wisdom tooth which is sore and my face is swollen." The writer advised immediate extraction of the tooth, and in one week's time the eyesight returned as it did following the treatment of the upper tooth. Sight remains normal at this time.

The case of Mr. "B.": Mr. B. suffered from an attack of acute rheumatic arthritis. He could reach the office only in an automobile and take his position in the chair only with the assistance of one or two nurses. The party had been in good health, previously, holding a clerical position with the Burlington railroad. He came to the writer with this statement: "Doctor, they tell me my trouble is due to my teeth. A physician and two dentists have advised to have them extracted. I have come to you to see if there was any way possible of saving at least some of my teeth." I replied that I would answer him after a thorough examination. The physician in the case had made a blood count. He reported 15,000. His report on blood pressure was so high that I verified it by taking it myself and I found it to be 210. The physician stated that an analysis showed the urine to be heavily loaded with urates. There was one piece of bridge work and several fillings over pulp devitalizations in the mouth. A complete radiographic examination of the entire mouth was made. We found five teeth with imperfect root fillings and each with a well-defined granuloma attached near the apical foramen. No pyorrhea seemed to be present. We advised the patient that we would attempt the saving of these teeth one at a time, and not disturbing more than one within each period of eight days. Those of you who are familiar with the laws of allergy readily detect the reason. He also was informed that in case regeneration did not seem to be satisfactory and in case also that his general trouble showed no improvement, we would then attempt surgery, and by the way, one tooth at a time, taking advantage of the scientific results of autogenous vaccine treatment.

One tooth was opened up and treatment made. There was no reaction. Patient remained the same. A correct root filling was made and proven by the radiograph. The second tooth was opened up. Again no reaction. No change in general health. Correct root filling made and a third tooth opened. No reaction. Correct filling made. A fourth tooth opened up and still no reaction and a correct filling made. The fifth and last tooth was opened when a violent reaction occurred. Patient developing a marked rise in temperature within seven hours of the operation. To shorten the story we will say that the patient could not return to the office for two or three days, but was bedridden. At the end of the week, he entered the chair unassisted and at the end of two weeks he gave evidence of an almost complete cure and the third week resumed his position with the Burlington. He has had no return of the arthritis. His blood pressure has lowered. He declares himself to be and it appears that he is, a well man.

This is only two of many scores of cases which I could relate. It is therefore without foundation when you question in the least my appreciation of the seriousness of the work, which is before us as a profession.

All this is brought about by the toxic effect of oral sepsis.

Duke says: "A *true* toxin is not formed by any of the organisms which ordinarily take part in the pathology of oral sepsis. Killed cultures of the organisms, or extracts of the organisms, or the culture media in which they have grown may be injected in large quantities into healthy guinea pigs without immediate gross ill effect. These organisms differ strikingly in this respect from tetanus and diphtheritic bacilli, each of which produces a true toxin, which is poisonous in high degree even when administered subcutaneously to animals in very minute doses. The products formed by certain organisms which inhabit the mouth may be extremely toxic, however, through the development in an individual of a condition known as allergy. This term introduced by Von Pirquet is used to designate the changed condition of humans or animals caused by infectious diseases or produced by inoculation with alien proteins which causes the individual to react in a peculiar way if the bacteria responsible for the infectious disease or if the protein with which he may have been inoculated is reintroduced into the circulation. The ensuing reaction is in some respects protective and beneficial, but in other respects it may be harmful and even dangerous.

"Allergy and its effects are well illustrated by the action of tuberculin. Killed tubercle bacilli or their extracts, or media in which tubercle bacilli have grown, may be injected in large amounts into normal untreated animals without gross immediate ill effect. If even minute quantities be injected into animals or individuals with tuberculosis, however, the effect is entirely different. Instead of its being apparently inert, it causes a reaction which may result quickly in death. The changed condition of the animal produced by the tuberculous infection which renders it sensitive to the products of the tubercle bacillus is the condition known as 'allergy'. Several striking phenomena follow the introduction of tuberculin into tuberculous individuals or animals which never appear in the nontuberculous. These are: *First*, pain, swelling, redness, and sometimes necrosis, at the site of the inoculation; *second*, a rise of temperature and pulse rate and general symptoms of toxemia; *third*, inflammatory changes at the site of all active tuberculous lesions. This last phase of reaction may be slight or may be well marked. It may hasten the breaking down of tuberculous tissue and lead to rapid spread of the disease.

"Some individuals with tuberculosis become so sensitive to products of the tubercle bacillus that amounts of tuberculin as minute as one one-thousandth of a milligram are sufficient to produce severe reactions. Others tolerate larger amounts.

"A reaction as above described can be produced in tuberculous animals by the subcutaneous injection of living tubercle bacilli as well as by extracts of the organisms. If tuberculous guinea pigs are inoculated with living tubercle bacilli, a local and general reaction results similar in its essentials to the reaction produced by extracts of dead bacilli. If a localized tuberculous lesion in humans (such as a tuberculous joint) is subjected to massage and manipulation, living tubercle bacilli and their products gain entry into the circulation and a transitory rise of temperature and other symptoms of reaction follow.

"The above well-known facts regarding tuberculous infection and the sensitization produced by it are true of infections in general. An attack of typhoid, for example, renders an individual sensitive to the protein of the typhoid bacillus; an attack of furunculosis renders one sensitive to the staphylococcus aureus, etc., so that individuals having these diseases usually show a local, general, and focal reaction if they are inoculated with killed cultures of the offending bacteria. This may temporarily increase the inflammatory processes, the severity of which would appear to depend to a certain extent upon the quantity of bacteria injected.

"Individuals with chronic furunculosis react and show temporary exacerbation of the disease, not only when inoculated with an excessive quantity of killed staphylococci, but also when they are subjected to the effect of an increased number of living bacteria due to the development of a fresh furuncle. This often causes both a general and a focal reaction. For example, with the development of a fresh furuncle there may appear fever, malaise, etc., (general reaction) and an exacerbation of the inflammatory process in the healing furuncles (focal reaction), in fact, signs of activity, such as itching, redness, etc., may appear in the scars of recently-healed furuncles. This may be followed by a discharge of pus containing staphylococcus aureus.

"These well-known principles which are true of infection in general also are applicable to oral sepsis. Individuals with dental sepsis become sensitized to the protein of the infecting organisms. The protein of these organisms is to them no longer harmless and inert, but may under certain circumstances be poisonous to them. The protein of these organisms is thereafter a possible source of systemic disturbance. The sensitization produced is similar in every way to that observed in individuals with tuberculosis, furunculosis, etc., and the reactions which follow inoculation with killed bacteria by nature as a result of the development of a new infection are similar in every respect to those of the foregoing examples.

"If an individual with oral sepsis develops an acute infection, such as tonsillitis or an acute alveolar abscess due to the same organism which may be infecting the gums, a general reaction follows, due to the action of the protein of these micro-organisms upon the sensitized individual. A focal reaction in the gums may follow this and may cause a rapid increase in the inflammatory process there localized. It is possible for a focal reaction to occur even in lesions of the gums which have nearly healed and in this way cause recurrence of an apparently cured case of pyorrhea. Focal infections such as chronically-infected tonsils, alveolar abscesses, etc., often harbor the same organisms as infected gums and often prevent permanent cure of oral sepsis, which is, therefore, often dependent on the removal of all other sources of systemic infection.

"In the previous paragraph the effect which coexisting infections may have upon oral sepsis has been dwelt upon. Oral sepsis may have an analogous effect upon all chronic foci of infection located elsewhere in the body which harbor the same micro-organisms; for example, an acute alveolar abscess may cause a focal reaction in a chronically-infected tonsil and give rise to an attack of acute tonsillitis. Likewise, it may cause a focal reaction in a chronically-infected appendix, gall bladder or gastri mucosa and give rise to acute symptoms of local inflammation. The extraction of badly-infected teeth may have the same effect, and may be followed in less than twenty-four hours by a severe, acute, inflammatory reaction in distant organs (evidently a focal reaction). So prompt an effect must be the effect of a reaction in the secondary focus followed by the rapid growth of organisms already there localized rather than to a fresh acute metastatic infection from the alveolar process.

"The treatment or extraction of infected teeth frequently causes acute reactions in infected organs and occasionally in this way causes spread of disease; but the good eventually derived usually far outweighs the ill, particularly if the treatment or extraction is done in series. Frequently the clinical manifestation of chronic appendicitis, cholecystitis, gastric and duodenal ulcer, chronic arthritis, etc., clear up rapidly after such work upon the teeth even though the first effect may have been an increase in the inflammatory processes. Occasionally chronic inflammatory conditions which appear rather urgently to indicate the need of surgery clear up after as simple a procedure as the treatment or extraction of a tooth. Even more gratifying is the relief occasionally obtained in chronically-inflamed organs which cannot be handled surgically, such as chronic nephritis.

"Combined with chronic inflammatory diseases of any organ there frequently exists a functional disturbance in the organ which appears out of all proportion to the gravity of the inflammatory lesion. This is without question frequently the effect of repeated focal reaction in the organ caused by activity in some distant focus. It is perhaps for this reason that uremia and other symptoms of renal insufficiency in cases of chronic intestinal nephritis, cardiac insufficiency, and arhythmia in cases of chronic myocarditis, etc., often are relieved in a most gratifying way by the treatment of oral sepsis or other foci of chronic infection.

"The sensitization of an infected individual against a given organism may be increased by repeated inoculations hypodermically with the protein of that organism. The same procedure may produce tolerance for the organism. Whether the effect produced is increased sensitiveness or increased tolerance is largely dependent upon the rate at which the inoculations are given and the size and rate of increase in the dose. If the dose is too large or too frequently repeated, the sensitiveness may be increased. If the dose is not larger than can be tolerated by the individual and is not repeated too frequently, a high degree of tolerance may be gained. If tuberculous individuals are inoculated with large and rapidly repeated doses of tuberculin, a marked increase in sensitiveness is produced and a rapid advance in the disease may follow. This practice in tuberculin therapy has given disastrous results in the past. If tuberculous individuals are repeatedly inoculated with carefully-graduated doses of tuberculin at appropriate intervals, a tolerance may be developed which is so great that a quantity of tuberculin can eventually be given without deleterious effect which is thousands of times as great as that which originally would have caused reaction. The toxic effect of given infection would seem, on the basis of experimental results and the above cited facts, to depend in part upon the degree of sensitization in the individual, in part upon the degree of tolerance which had been developed, and, finally, in part upon the rate of regularity with which the organisms and their products gain entry into the circulation. This explains the fact that some individuals with dental sepsis show many of its toxic effects while others similarly infected show relatively few.

"In the preceding pages the toxic effect of bacteria and their products upon infected tissues has been dwelt upon. The effect which such products may have upon uninfected tissues is perhaps even more interesting, though perhaps of less clinical importance. This effect can be well illustrated by describing the effect upon animals of alien protein not of bacterial origin.

"It is now well know that normal untreated guinea pigs may be inoculated with large amounts of horse serum or other alien protein without apparent immediate ill effect and that if this inoculation is repeated after a period of several weeks, the animal is likely to die in a short time with a peculiar syndrome of symptoms which have been called anaphylactic shock. The term anaphylaxis was introduced by Richet who looked upon the phenomena fallaciously as an effect of a lack of protection. The phenomenon previously had been observed by Magendi and Theobald Smith. Since then, Arthus, Baughan, Von Pirquet, Rosenau and Anderson, Meltzer, Auer and Lewis, and others have added interesting observations which have made the subject one of great general interest. The symptoms produced by treating sensitized animals with alien proteins vary in different animals, vary with the degree to which the animals have been sensitized and finally vary with the nature and quantity of the protein used. Guinea pigs are quite sensitive to the effect of alien proteins, and if a second dose is administered to them after an appropriate interval of time, death often ensues as a result of bronchiole constriction and asphyxia. In other animals different symptons are dominant and often are of a relatively mild nature. The symptoms which may be expected in animals in more or less marked degree are as follows: Irritability followed by depression, prostration and often apparent paralysis, dyspnea, discharge of urine and feces, lowering of blood pressure, a rise or lowering of body temperature, reduction in the leucocyte count, eosinophilia, delay in the coagulation time of the blood, agglutination of the blood platelets with lowering of the platelet count as a result of the larger clumps being filtered off by the capillaries, constriction of the bronchioles frequently giving rise to an embarrassment of respiration which in the more extreme cases prevents entirely the expulsion of air and causes extreme inflation of the lungs, contraction of non-striated muscle generally giving rise to bronchiole spasm, increased peristaltic movement in the stomach and intestine, emptying of bladder and rectum, blood diarrhea, etc., increased glandular secretion especially of the liver, pancreas, lacrimal, and salivary glands, increased irritiability of the peripheral nerves, etc. In humans, anaphylactic symptoms occasionally follow the use of therapeutic sera, vaccines, etc. These are usually relatively mild as compared with those shown by sensitized animals. Those most frequently observed are urticaria, arhythmia, angioneurotic edema, pain and swelling of the joints and leukopenia. The symptoms in humans may be much more severe, however, and may in some instances simulate the severe symptoms observed in animals. Very severe reactions occasionally are observed after the use of pollen extracts in the treatment of hay fever and asthma.

"Guinea pigs, which are highly sensitive to anaphylactic shock, may be sensitized by minute quantities of a foreign serum. One one-thousandth milligram or less, often suffices to sensitize them to such a degree that a subsequent injection of one-twentieth c.c. or more, given after an incubation period of two or three weeks, almost invariably results in convulsions, constriction of the bronchioles and rapid asphyxia.

"Guinea pigs may be sensitized to alien protein by methods other than that of subcutaneous inoculation; for example, they can be sensitized by the feeding of certain proteins, by the introduction of proteins through the skin by inunction, through the mucous membranes of the colon by rectal injection, through the mucous membrane of the respiratory tract by the use of spray, etc. In fact if an alien protein gains entry undigested into the circulation or tissues in any way, it may be sensitized.

"Proteins vary in the degree to which they can sensitize. Serums and egg albumens, for example, may produce a high degree of sentitization, whereas bacterial proteins usually produce relatively very little.

"Protein sensitization as observed clinically in humans probably has many sources of origin. It is difficult to understand just how the sensitization takes place. Some individuals, for example, become sensitized to the protein of certain articles of food (egg, beef, strawberries, etc.), some to the pollen of plants (ragweed, golden rod, etc.), some to animal odors (horse, cat, guinea pigs, etc.) The sensitization may reach such a degree that whenever the individual comes in contact even with minute amounts of the protein to which he is sensitized certain disagreeable and even dangerous symptoms of anaphylaxis are noticed, in fact, in many individuals almost infinitesimal quantities of the offending protein may produce severe symptoms of anaphylaxis. Individuals sensitized to horse albumen may show symptoms of anaphylaxis after inhaling the infinitesimal quantity of horse protein in the air around horses. Individuals sensitized to egg albumen may have urticaria after eating minute quantities of egg albumen. Individuals sensitized to plant pollen may have hay fever or asthma after contact with the minute quantity in the air. Severe anaphylactic shock can be produced in such individuals by the subcutaneous injection of as small an amount as one one-thousandth milligram of an extract of the pollen to which they are sensitized.

"The degree to which sensitization may develop in humans is almost unbelievable. Duke observed a patient who was so sensitized to cat protein that whenever she was in the room with a cat, symptoms of anaphylaxis were noticed. She told friends of this peculiarity. One disbelieving brought a kitten into the house in his pocket believing that if the patient were not aware of its presence, the symptoms would not appear. The effect on the patient was such, however, as to alarm the entire household and convince the friend that the experiment would not bear repetition. Kolmer mentions an instance of an individual so sensitized against rabbits, guinea pigs, and horses, that if the air of the room in which these animals were kept was passed fifteen minutes through lint and the lint extracted with saline solution, the application of this extract to the abraded skin of the individual would cause a marked local reaction. Protein sensitization acquired in nature as above described is greater in degree than that produced experimentally in animals or humans by the subcutaneous injection of a foreign protein. It is also of longer duration. Sensitization against plant pollen, for example, may last for years, whereas that produced artificially often diminishes rapidly after a few weeks.

"The above examples show the effect which may be produced, of illustrating the extreme and diversified effect which may be produced under certain circumstances by small amounts of protein which to non-sensitive individuals are practically harmless. In pyorrhea pockets and alveolar abscesses the tissues of the human come in intimate contact with alien proteins and split proteins of many types and sources due to the activity of bacteria, protozoa, etc. The individual is not protected from the absorption of these by an intact epithelial membrane. It seems reasonable to presume that these occasionally gain entry into the tissues and blood and sensitize the individual in high degree and by virtue of this become possible sources of anaphylactic phenomena. Whereas bacterial proteins are not prone to cause the so-called anaphylactic phenomena experimentally, the fact that such may occur as an effect of bacterial products has been shown by the researches of Baldwin and Krause who, working with the protein of the tubercle bacillus were able to produce in animals all the striking anaphylactic phenomena observed experimentally after the use of serums."

So much as to the theories of sensitization. Now as to the development of immunity.

A thorough study of the laws of acquired immunity will serve to modify the conclusions of some of our extremists. Some degree of resistance against parasitic attack seems to be mainfest by all animals. Resisting bacterial infection is often a natural inborn quality of an individual. The reverse is also true. Hence, the terms immunity and susceptibility. Immunity under such circumstances is termed natural immunity. It is a proven fact that immunity may be acquired and intentionally produced. Such immunity may be either active or passive. It is the active acquired immunity which is of most interest to us in this study. Immunity may be acquired in several ways.

1. By placing in the blood stream fully virulent bacteria.
2. By injecting living bacteria of diminished virulence.
3. By the incorporation of dead bacteria.
4. By the admittance to the blood stream of the products of bacteria either secreta or excreta.
5. By the introduction of the disintegrated products of these cells after death.
6. By the injection of certain organisms or their products which are not associated in the production of the specific affection.

This paper is already too long; hence, it is not possible for us to go into full consideration of the production of immunity. But such phenomena do occur and must be regarded as a possibility. This will explain why one patient will carry about in his mouth several well-marked, localized infections seemingly without any general systemic manifestation, whereas the next patient may be so thoroughly sensitized to infection that very small infected areas cause pronounced general disorders. It is notorious that alveolar abscesses are common in the English mouth and yet many of them seem to live to a ripe old age. This does not augur that the patient should be left to continue the absorption of this infection as immunities are not always permanent.

You will pardon me if I again quote from Duke's writings. I cannot improve on his phraseology or logic.

"The importance of oral sepsis as a source of metastatic infection is not small. It is the most common of the chronic infections, therefore one of the more important. It is a less apparent source of disease than the tonsils. The difference is, however, probably more apparent than real." In this connection I again quote Dr. Hartzell in the September SUMMARY. "The individuals who advocate complete destruction of dental organs in order to rid the body of streptococcal growth, therefore evidence profound ignorance. Wholesale extration of teeth will not rid the body of streptococcal growth. One might as well advise removal of the transverse colon to rid the body of the colon bacillus. A much more sane method of cutting down the inroads of mouth infection is that of vigorous systematic mouth sanitation together with the adoption of a diet planned to prevent intestinal putrefaction. This is just as capable of reducing the enormous mouth growth to a safe minumim as are the present methods of controlling bacterial growth in milk, now demanded by our cities. The difference by weight and count in the number of bacteria per milligramme of tooth scrapings in dirty mouths to that of reasonably clean mouths, has been shown by Kligler and Gies to range from eight hundred million in the dirty mouth to five to eight million in the clean mouth. Translated into terms of oral prophylaxis, we may find that ten minutes a day spent in proper mouth sanitation will produce this safe minimum. The writer's first thought then in regard to the extraction question is that correct mouth sanitation and proper diet will make ruthless extraction of teeth unnecessary. A proper education of the dental profession in a broad way will soon enable them to place in a true perspective the factors which actually justify conservation or, on the other hand extraction.

"Please recall that the mouth streptococcus makes its appearance at birth, and that it forms (roughly speaking) half the mouth growth; also that our bodies are of greater or less degree sensitized to its presence, and that its most destructive attribute is the production of secondary anemia. Its toxins lessen vitality and lay a foundation of physical weakness in an individual for its ravages in the tissues when it becomes too numerous for the leucocytes in the blood stream to destroy the individual members of the family, which gain access to the stream. Therefore, the first broad view that should come into the mind of an individual as to the conservation or destruction of infected teeth should rest on the wealth or poverty of the blood stream. To illustrate, an individual with a full complement or red cells, five million to the cubic centimeter of blood, with a hemoglobin of not less than eighty-five and a leucocyte count of seven to eight thousand to the cubic centimeter, together with a normal urine, and a reasonable amount of energy, is safe in conserving any of his dental organs which might present for treatment. This conservation should be first, the reduction of mouth growth by prophylactic means to as nearly as possible the minimum, and, where teeth must be devitalized, such devitalization should be done under exactly the same kind of surgical asepsis, as is demanded of surgery of the brain or abdominal cavity."

In conclusion, as I have already taken too much of your time, I will say that the salvage of pulpless teeth is not necessarily a difficult matter. It consists of strict care as to asepsis. The cementum must be maintained vital. *A tooth is vital in proportion to the vitality of its cementum and peri-cementum.* Where these tissues are dying the tooth is in great danger of being lost. When all or any great portion of the cementum is non-vital the writer knows no means of saving the tooth. The dead cells of the cementum never again will become attached to living cells. The detached area always will remain a source of secondary infection. If this dead cementum is gingival, as in cases of pyorrhea, the treatment is entirely one of surgery. The pocket must be removed either by the extraction of the tooth or by resection of the external tissues. If the denuded and dead cementum is midroot only, the writer knows of no means of salvage. If the dead cementum is very small and near the foramen, its incapsulation with an impervious material seems to effect a cure of cases both local and general. Please understand us when we say small. We mean areas not much larger than the mouth of the foramen. When this dead cementum is about the apex of the root of the tooth and is confined to the apical third or less, and the remaining cementum of the tooth is vital, root resection in a large per cent. of the cases is proving, at least for a time, worth consideration. The operation of root resection is nothing more or less than bone surgery, as in the removal of a portion of bone for necrosis and the chances of success are about the same in each case. In the meantime let the practicing dentists educate themselves in general clinical diagnosis builded upon a foundation of a working knowledge of physiology by special courses of study. Physicians and dentists can then get together on common ground to the mutual benefit of the public and the professions of Medicine and Dentistry.

RETENTION OF FULL DENTURES*

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THE FUNDAMENTAL PRINCIPLES underlying the retention of artificial dentures, and of which we must possess thorough knowledge before we can intelligently make use of their application, are:

First, thorough knowledge of the physics involved.

Second, full recognition of the requirements of the design of the denture for the maximum utilization of the retaining forces.

Upon attempt to express my views in this subject I found it necessary to formulate and definitely define terms that were accurately descriptive of my thoughts. Therefore, it will be necessary that we first acquaint ourselves with the following terminology before procedure with our subject will be in order.

To begin with, let us define some of the terms commonly used in denture nomenclature, which, it seems, are lacking in accuracy of definition and specific application. Also, perhaps, let us add some new terms, and then when used in the treatise to follow, interpret them accordingly.

First, let us define the term *Jaw*.

Jaw may be defined as meaning all surface tissue of the jaw ridge, and in case of the upper, the hard palate, upon or about which the base of an artificial denture is adapted and indirectly supported or retained, excepting then, the attached flexible peripheral tissues. These may be more specifically described as all tissues, the fixed or rest position of which are not modified by muscular action.

Second, Flexible Peripheral Tissues.

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*Read before the Nebraska Dental Society, May, 1919.

Flexible peripheral tissues may be defined as meaning all tissues attached to the jaws that are moved or are movable by the action of the muscles including the soft palate.

Third, Base.

Base may be defined as meaning that part of the surface of an artificial denture that is adapted to and covers the jaw.

Fourth, Periphery.

Periphery may be defined as meaning that part of the border surface of an artificial denture adjacent to or continuous with the base that is adapted to and covers the flexible peripheral tissues.

Fifth, Interposed Saliva.

Interposed saliva may be defined as meaning the saliva interposed between the denture and the adapted tissues.

Sixth, Adaptation.

Adaptation may be defined as meaning degree of conformity and closeness of apposition of the outline and of the surface of the base and periphery of an artificial denture with that of the jaw and flexible peripheral tissues, to establish such relation as will bring their surfaces within the required distance or proximity to each other and make active the adhesive and cohesive forces of the interposed saliva between and throughout the complete surfaces of the jaw, flexible peripheral tissues, base and periphery of the denture.

Seventh, Basal Seat.

Basal seat may be defined as meaning the relation the base of the denture bears to that of the indirectly supporting or retaining jaw in the state of adaptation. The jaw does not support or retain the base directly, but indirectly through the medium of interposed adhering saliva, the actual seat of the denture being formed and made up by and of the film of the interposing saliva upon or about which, through its adhesive and cohesive forces, the structure is supported or retained.

Eighth, Peripheral Valve Seal.

Peripheral valve seal may be defined as meaning adaptation between the periphery of the denture and the flexible peripheral tissues to effect valve action and prevent the ingress of air beneath the base of the denture in case of displacement.

Ninth, Retention.

Retention may be defined as meaning resistance of the restoration to displacement and dislodgment.

Tenth, Displacement.

Displacement may be defined as meaning any change in relation of the base with that of its basal seat.

Eleventh, Dislodgment.

Dislodgment may be defined as meaning breaking of the seal of the peripheral valve.

Twelfth, Adhesion, Cohesion, Vacuum, Partial Vacuum and Atmospheric Pressure.

Adhesion means the force exerted by the attraction of unlike molecules for one another.

Cohesion means the forces exerted by the attraction of like molecules for one another.

Vacuum means confined space devoid of matter.

Partial vacuum means confined space with degree of emptiness.

Atmospheric pressure means the force exerted by the weight of the atmosphere which envelops the earth, the weight of which, at sea level, exerts a pressure of 14.7 pounds pressure to the square inch.

The physical forces retaining an artificial denture in the absence of valve seal, are adhesion and cohesion. The physical forces retaining an artificial denture with valve seal, are adhesion, cohesion and atmospheric pressure. The force of the atmosphere being potential, which, at the point of displacement becomes kinetic.

Adhesion in this particular is the aggregate molecular attraction exerted by the molecules of the interposing saliva for those of the substance of the structure of the base of the denture and those of the adapted tissues.

Cohesion is the aggregate molecular attraction exerted by the molecules of the interposed saliva for each other in value as the surface and conformity of the base covers and hugs the adapted tissues.

Atmospheric pressure, contrary to the opinion of many, is not a kinetic force acting conjointly with adhesion and cohesion in the position of basal seat. The space between the denture and the adapted tissues is completely filled with aerated saliva equalizing the pressure within the space with that of the atmosphere without the space. In substantiation of this claim we quote from Ganot's physics, the following:

"Adhesion—The molecular attraction exerted between the *surfaces* of bodies in contact is called *adhesion.*

Adhesion takes place between solids. If two leaden bullets are cut with a penknife so as to form two equal and brightly polished surfaces and the two faces are pressed and turned against each other, until they are in the closest contact, they adhere so strongly as to require a force of more than the weight of 100 grammes to separate them. The same experiment may be made with two discs of glass which are polished and made perfectly plane. When they are pressed one against the other, the adhesion is so powerful that they cannot be separated without breaking; hence the particles have been brought within the distance of molecular attraction. As the experiment succeeds in *vacuo,* it cannot be due to atmospheric pressure, but must be attributed to a reciprocal action between the two surfaces."

Since previous reading and publication of this paper the author has acquired the following information: The Department of Physics of the University of Chicago is on record as having performed an experiment with glass planes pressed together and having water interposed to exclude air. Attempts to separate these planes of glass were found to meet with resistance both in the presence of air and in a vacuum. The conclusion drawn is obvious: The attraction between the planes of glass being attributed to adhesion solely.

Were the maximum pressure of the air utilizable by complete removal of the interposed saliva and evacuation of the space thus formed, we could then have the maximum pressure of the air or 14.7 pounds pressure to the square inch of base and peripheral surface covering the tissues, retaining the denture. But could the maximum pressure of the air be utilized through such source, the human tissues will not tolerate permanently even a partial vacuum of any appreciable degree. We see this demonstrated in the air chamber commonly used in attempting to permanently aid retention of upper dentures by this means. Hypertrophy of the tissues occurs and the cavity fills. Thus do we conclusively show that atmospheric pressure cannot be utilized as a *constant* force to retain artificial dentures, owing to the fact that, the interposed film of aerated equalized saliva between the denture and the adapted tissues cannot be dispensed with, and nature will not tolerate the negative pressure of vacuation about her tissues to make manifest such pressure by means of vacuum. Therefore, it must be considered that we have no *degree of vacuation* existing between the denture and the adapted tissues, consequently, no possible aid from atmospheric pressure retaining the denture in the position of basal seat, but that it is supported or retained in proximity with the adapted tissues by the attraction of the molecules of the interposed liquid for those of the denture.

Since we know the relation or state defined as adaptation not to exist when an artificial denture is first introduced into the mouth, and until adaptation evolves by wear, permitting the tissues, as they do, to fill in and shape themselves to conformity and apposition with the surface of the base, we also know that during this introductory period, so to speak, while the tissues are adjusting themselves establishing adaptation or the relation termed basal seat, partially evacuated spaces exist between the denture and tissues about areas not in sufficiently close apposition to establish adaptation. Therefore, in this connection, it is conceded that atmospheric pressure is an aiding force retaining a denture conjointly with adhesion and cohesion. Also does it solve in part the perplexing puzzle of why many dentures loose their fit—so called. Nature responds to the negative pressure of evacuation, the tissues fill in and obliterate the spaces and the force of the atmosphere becomes *nil* and the denture is retained by adhesion only.

A most excellent chapter upon the question of atmospheric pressure as it relates to denture retention is that contained in Wilson's Dental

Prosthetics, by Dr. George H. Wilson, and is earnestly commended for your careful reading and study.

Now, that we have shown that adhesion is the retaining force that holds the denture in proximity with the adapted tissues we shall proceed to show that the strength of the adhesive force is not the force actually determining that required to displace the structure, but that the force determining the power required to displace the denture is that of the cohesion.

The degree of viscosity of the saliva makes it a liquid the molecules of which, in this connection, have greater adhesive power than cohesive power.

A chain is no stronger than its weakest link. Let us assume the molecules of the interposing liquid—the saliva—to be links of a chain.

Since the adaptation of an artificial denture cannot be made so close as to reduce the interposing film of saliva to one layer of molecules, and since the adhesive forces of the molecules of the saliva are greater than those of the cohesive, this means that the interposed saliva in the space between the adapted tissues and the surface of the denture—the chain—has a weak link in its middle. Displacement then, occurs by breaking the weak link—the cohesion.

Since the retaining force offered for resistance to displacement of the denture by cohesion alone is low in comparison with that required to resist the displacing forces of efficient incision and mastication, displacement of the denture easily and readily occurs.

How then, may aid by utilization of the force of atmospheric pressure be accomplished for retention of an artificial denture for the efficient incision and mastication of food?

Aid by means of the force of the atmosphere may be indirectly accomplished by the formation of an emergency partial vacuum arising momentarily and simultaneously with displacement of the denture by the forces of incision and mastication or by any other force causing displacement of the structure.

DENTURE DESIGN

The requirements of denture design for the accomplishment of the emergency partial vacuum are that the base of the denture should cover and be adapted to the entire surface of the jaw, and have added to it a periphery with border surface continuous with that of the base of the denture, and that the surface of such border be extended upon and adapted to the flexible peripheral tissues so that there is created a seal and valve-like action between the flexible peripheral tissues and the surface of the periphery. To preclude, therewith, the ingress of air under the base of the denture and resist or prevent dislodgment of the same through the indirectly-applied resisting force of the atmosphere should displacement occur.

Preventing the ingress of air between the surface of the base of the denture and the tissues of the jaw at the time of displacement of the restoration, sealing the space occurring between the base and jaw without admitting the air, forms, simultaneously with displacement, a partial vacuum.

The *tidal* or momentary partial vacuum created between the base of the denture and the adapted tissues of the jaw is therefore manifested only when the resistive forces of the cohesion of the molecules of the interposed saliva are overcome and displacement of the denture occurs. Since the resultant atmospheric pressure is the direct force resisting dislodgment of the denture when forces displace the structure, forming a relative partial vacuum, it is obvious that any force that creates and increases the space, degree of vacuity and resultant atmospheric pressure, increases, simultaneously, resistance of the denture to dislodgment. The degree of vacuity of the space is in direct ratio to the volume of the vacuum, owing to the fact that the sealed periphery precludes the ingress of air and the increasing space between the base and the jaw still accommodates the same quantity of air. Boyle's law governing the relationship between the pressure and volume of gases under a constant temperature covers this point and is as follows: "Pressure of a given mass of gas varies inversely as the volume of the space within which it is confined."

That is, if the volume of space existing under the denture consists of 1 c.c. at a pressure of one atmosphere, when increased to 2 c.c. of volume the pressure according to this law would be one-half of an atmosphere.

CONCLUSION

Extent of adapted surface tissue then, determines the relative extent of the respective forces exerted by adhesion and cohesion.

Peripheral construction and adaptation for a seal and valve-like action with the flexible peripheral tissues, sealing space occurring between the base and jaw created by displacement of the denture, preventing the ingress of air, forming a relatively-increasing partial vacuum indirectly applying the force of the atmosphere thereby, aids in preventing or opposes dislodgment of the artificial denture should displacement occur.

Credit for the idea of constructing and establishing such design and relations between the base, periphery, jaw and flexible peripheral tissues, should, in so far as we are informed, be given Dr. W. V. B. Ames, of Chicago, for it was he who first conceived of their importance and in 1885 (*Independent Practitioner*, July) demonstrated their principles. Others notable in early appreciation and use of these principles were the Greene brothers, of Missouri, and special admiration and appreciation should be held for their constant, untiring and presistent labors for their adoption. Credit belongs to these men for the correctable modeling compound method. Also the excellent work of Mr. Samuel G. Supplee, of New York, on the technic in the use of modeling compound should not be overlooked, and likewise that of Dr. Russel W. Tench, of New York. The great good these men have done in directing us to a better understanding of its manipulation and possibilities should be appreciated. Through their work and efforts our knowledge and technic in impression taking has been greatly improved.

The method of impression taking for denture adaptation and outline of design to be illustrated and described, permits, it is believed, of an infinitely greater tissue surface adaptation and wider range of movements of the denture without causing displacement and unsealing or breaking of the peripheral valve seal than is secured in less accurate methods of adaptation and design or in the old style of design where peripheral adaptation and valve seal are entirely absent and the edges of the denture permit the ingress of air and dislodgment of the restoration.

CLASSIFICATION OF JAWS*

*This classification concerns forms of jaws as they relate to the physics of denture retention and not to tissue conditions. Tissue conditions are important factors but are not considered in this paper.

The retention of an artificial denture can be no better than the jaw supporting or retaining the substitute. Hence, the thoroughness with which we study and utilize the jaw will determine in a large measure the success or failure of the restoration. Likewise, in the same sense that it is desirable to classify the teeth themselves, the various classes of malocclusion of the teeth, and make other classifications, it is desirable to classify edentulous jaws.

Edentulous jaws may be classified and divided into two general groups, and through such classification the operator may be directed to a better understanding of the *modus operandi* he should pursue in a given case to obtain the best results.

Class I may be designated as that type of edentulous jaws that may be classed as normal—jaws with well-defined ridges.

Class II may be designated as that type of edentulous jaws that are abnormal—jaws with poorly-defined or excessively-absorbed ridges.

I wish to interpolate at this point that there exists, of course, all the gradations of forms and irregularities between Class I and Class II. This classification, however, deals only with the two extremes. Understanding and mastery of the requirements of Class II jaws, representing the ultra difficult type, makes management of the types intervening between Class II and Class I easy of accomplishment.

Class I jaws offer the greater amount of tissue surface for adaptation. The well-defined ridges also offer mechanical retention, assisting in securing the denture against horizontal mobility, and, in the case of undercuts, secure the restoration against vertical movement. Peripheral construction and valve seal are not so essential to passably satisfactory retention in this class.

Class II jaws are *entirely dependent for retention upon the physical forces alone,* no mechanical retention whatsoever being afforded. Jaws of this class require for their successful management the closest adherence to every detail. Peripheral construction and valve seal should be carefully and positively secured.

IMPRESSION TAKING

The basic essential in the taking of an impression for full and complete utilization of the jaw and flexible peripheral tissues desired to be utilized for the retention of an artificial denture is a tray suited to the case. It is believed that the only accurate and satisfactory way to procure a suitable tray, is to construct a special tray for each individual case.

IMPRESSION MATERIAL

Plaster of Paris, mixed to the correct consistency, is far more yieldable and adaptable than any other material with which we are familiar, and by the aid of a correctly-formed individual tray, may be handled with such control that any desired form of impression may be secured.

INDIVIDUAL TRAYS

For the construction of individual trays, we use the S. S. White Impression-Tray Compound, which was suggested and prepared for the particular purpose of making individual trays quickly, efficiently and economically. It is jet black in color to make it readily distinguishable; has a high melting point to assure, when set or hardened, ample rigidity against distortion in removal from the metal tray and subsequent shaping and handling.

It is necessary in employing the impression-tray compound to have a few regular metal trays of suitable forms and sizes. Select a tray of the proper shape for the case, but somewhat larger than you would ordinarily use. Fill the tray with the compound, softened in hot water. Pass the exposed surface of the compound over a Bunsen or alcohol flame to remove inequalities in the surface and give it a glaze. Plunge into hot water to wet the surface and prevent sticking to the tissues, and as soon as it cools to a bearable degree insert in the mouth and secure a compound impression in the regular way. In a short time it can be removed from the mouth and placed in cold water to harden.

Remove the impression from the metal tray, and with a sharp knife, trim away the excess compound approximating the peripheral outline and contour of the proposed tray. (Approximating the contour of the proposed restoration in the tray should be credited to Dr. M. H. House).

TRIMMING THE UPPER TRAY

Beginning at the labial margin, the tray is trimmed thin at the labial frenum, and the frenum allowed liberal relief. Passing on to the region formerly occupied by the cuspid teeth on either side, the tray is allowed to retain such fullness and height as required to restore the cuspid eminences. The tray should be as high and full as may be required to lift or displace the tissues for retention of the proposed denture and restoration of disturbed facial contour—the idea being to accentuate—build up the jaw ridge, increasing its area, and make in the finished impression the desired facial restoration in the region of the peripheral border of the denture.

Passing posteriorly from the cuspid eminences or about midway between the cuspid eminences and the tuberosities, we find the molar process of the maxilla, which registers a downward curve in the compound impression. The process is thinly covered with tissue and disposed at an unfavorable angle to permit of much vertical movement or bearing of the denture in this region and undue pressure of the same should be avoided.

Moving posteriorly of the molar process, a well-defined cavity, as a rule, is found, and offers extremely valuable area for peripheral adaptation and retention. This space may be called the buccal cavity, and defined as the cavity formed and bound by the molar process, the cheek, the angle of the mouth and the tuberosity. It is indeed amazing how little this valuable space is utilized, and on the other hand quite astonishing how extensively it may be utilized.

In forming the tray for this space, allow it to go well up into the cavity, filling it buccally as well as vertically, preferring, however, to accentuate or favor vertical height rather than buccal fullness. Next, outline and trim the posterior or palatal border of the tray. The outline and length of the tray should approximate that of the junction of the hard with the soft palate.

The Foveola Palatina (*Rauber Kops' Anatomy*) indicate the junction of the hard with the soft palate in the median or at the palatal suture. The Foveola Palatina and the general demarcation between the hard and the soft palate are taken as guides by which the length and the outline of the tray may be definitely determined. Finally, cut out the tray-relieving locks about undercuts and points of impingement upon soft flabby ridge tissues allowing them to hang freely in the tray.

TRIMMING THE LOWER TRAY

The general preparation of the lower tray is the same as that of the upper. The lower jaw, however, has its individual characteristics. One is, that absorption takes place in such manner that the curve or circumference of the ridge remains practically unchanged or fixed. Whereas, in the case of the ridge of the maxilla, absorption reduces its circumference quite extensively. Consequently facial contour is less disturbed in the loss of the lower teeth than of the upper. Therefore, less fullness is required in the lower denture for the restoration of lost facial contour than in the upper.

The lower jaw, like the upper, also has much overlooked and neglected valuable tissue surface for adaptation for retention. Aside from our failure to utilize the available area generally, the lower, like the upper jaw, has, as a general rule, two spaces that are much overlooked. These may be called the lingual spaces. They lie on either side of the tongue and are bound by the mylohyoid ridge, the floor of the mouth and the tongue. These spaces are when present and utilized, valuable aids to denture retention in excessively absorbed or so-called flat jaws. Fit the tray well into these spaces, aiming to utilize them in the completed denture. The supporting ridge of the lower jaw is more or less circular back to the region of the first molars. The diverging flanges formed by carrying the periphery of the denture into these lingual cavities will act as tangents to the circle and prevent, or assist in preventing horizontal movement of the circular base.

The individual trays being approximately outlined, are now ready for final shaping and conformation to the tissues.

SHAPING AND CONFORMING THE UPPER TRAY

When greater accuracy of conformity of the tray margin to the peripheral tissues is indicated than is secured by trimming the tray with the knife, there are two ways of accomplishing such accuracy. One method is that of the late Dr. Greene, previously referred to, and is no doubt familiar to most of you. The method consists of heating the edge of the black compound tray, and when necessary, tracing modeling compound upon the edge of the tray (tray of impression-tray compound the same as upon the edge of the metal tray) and while hot and plastic inserting the tray into the mouth, and having the patient make movements of the muscles, which in turn cause the softened tray edge or added compound to flow and conform to the tissues.

The other method is to apply plaster to the tray and adjust to place about the jaw as though it were intended to secure a finished impression. This application of plaster registers the position and approximate extent of the imperfections of the improvised compound tray. Where the tray is too long or impinges, the plaster is displaced, and where too short, plaster is added. The tray is freed of excess plaster and points of impingement are cut away to free the tissues impinged.

POST-DAMMING

Post-damming is a term adopted by and credited to the late Dr. J. W. Greene.

Since adaptation upon the flexible peripheral tissues of the soft palate for peripheral valve seal is a prerequisite to retention in its maximum degree, and since there is no means of confining or restricting the escape of the flowing thin plaster from the tray about the tissues in this region, as in the case of the labial and buccal borders where the tray is overlapped and bound in by the tissues of the cheeks and lip, it is obvious that adaptation of the palatal peripheral border of the denture to insure valve seal in this region must, if accurately made, be secured by means of some plastic material the flowing stress of which offers such resistance as may be required to insure adaptation of the periphery in this region. Modeling compound, used after the plan of Dr. Greene, post-damming as he called it, seems to be the ideal material for use in this connection.

Modeling compound is softened with dry heat and traced upon the palatal border of the black tray (the plaster having been removed from the tray in this region if previously used to shape and conform the tray margin). The tray is next dipped into warm water to prevent the compound sticking to the tissues when it is inserted into the mouth and adjusted to place. Adjustment of the tray to its seat is made as the varying temperature and flowing resistance of the compound against the tissues being impressed may indicate to effect the required amount of pressure upon the flexible peripheral tissues of the soft palate to insure valve seal, as adjustment of the tray to its seat progresses.

Securing adaptation upon the tissues of the flexible soft palate by this, or some equally scientific means, insuring uniform pressure upon the tissues, is strongly advocated.

Pressure engagement of the periphery of the denture with the tissues by molding or swaging the base upon casts that have been altered by cutting and scraping to increase the extent of engagement of the periphery with the flexible peripheral tissues, is guesswork and unscientific. The frequent injury of the tissues and the suffering imposed by such practice evidence the empiricism of the method and warrant discouragement of its practice. Casts made from accurate impressions secured in accordance with the demands of the case require no cutting or scraping.

SHAPING AND CONFORMING THE LOWER TRAY

The technic of shaping and conforming the lower tray is the same as that of the upper with the exception that post-damming has no connection with the lower jaw, and the final impression is confined to one mix of plaster, that is, if plaster has been employed to conform the tray margin; it is used as a guide to trim the tray or to add to it and is all removed prior to the application of the final mix of plaster.

The individual trays are now ready for the application of the thin creamy mix of plaster with which it is the plan to secure an accurate impression of the jaw under such displacement and pressure upon the tissues as previously decided advisable and predetermined in the preparation of the individual tray.

Construction of dentures for upper jaws not requiring facial restoration or permitting presence of base and periphery upon the tissues in the labial region of the jaw and flexible peripheral tissues, do not permit peripheral adaptation in the buccal areas under pressure upon the flexible peripheral tissues. Peripheral construction and adaptation in the buccal areas are desirable, but care should be exercised in preventing pressure. Force created by displacing the tissues would react against retention of the denture and would not, in the absence of peripheral valve seal in the labial region, be met with and overcome by atmospheric pressure by the forming of an emergency vacuum upon displacement of the denture as in the case of that afforded where peripheral construction and valve seal are complete and perfect. This class of case may be subclassed and would come under the heading of class I jaws.

Marshall-Field Annex Building.

DISCUSSION

DR. HAMILTON: I was one of the fortunate members of the class that Dr. Hall instructed last week. I was present when the set of dentures in the mouth of the patient present here was made. Now so far as discussing this paper is concerned, I cannot do it in the way that we generally consider a discussion, and that is by adverse criticism.

When he states that the impression is fifty per cent. of the work, I think he is just right. The other fifty per cent. is in the occlusion. I never knew what occlusion was until I saw him obtain occlusion in this set of dentures last week. The patient, Mr. Elliott, as he says, has been very enthusiastic and when he got this set of dentures made he took us all over to the Athletic Club, some twenty-two of us, and gave a "swell" dinner, which he seemed to enjoy just as much as the rest of us, and did not seem to have any more trouble masticating than we did. The man who is not today practicing advanced denture making is in the same position as the man would be who is not practicing inlay work.

THE PRESIDENT: I have been coming to the Nebraska state meetings for a good many years and this is the first time that I can remember that I ever heard Dr. Hamilton get upon the platform to give a discussion that he did not start a scrap. He must have learned something in that class. If Dr. Hamilton can do that, knowing his disposition as I know it, I know that all of you can learn something in a class like that, because Dr. Hamilton takes nothing for granted; he comes from Missouri; he has to be shown. Dr. Davis, of Lincoln, will discuss the paper.

W. CLYDE DAVIS: I feel that I only mildly express the appreciation of everyone present for the able address of Dr. Hall and am sure that we concur with him in nearly all that he has said, nevertheless, on one or two points we may disagree. It has been our experience that cases could and are improved on by the trimming of impressions and casts in the proper manner, the foundation of which has been laid down by Dr. Prothero, with such additional improvements as time and study have developed. We have heard it stated that it is unscientific and guess-work to change a cast in any way.

We claim that it is a matter of *judgment* not guess-work; that it is scientific, for it is systematized knowledge and acquired skill from observation and experience so classified and under the control of the mind and hand of the operator, that certain foreseen and desired results can with accuracy be predicted and accomplished. As any substance in a fluid state and having pressure is exerted equally in all directions, but to secure any pressure it would have to be confined therein only partially so in the taking of impressions, as the confinement varies with the tension of the mobile muscle tissues near the periphery of the tray. This is more or less under the control of the patient according to the nearness of approach to, and the amount of tissue or action of these tissues. This at no time would be sufficient to cause expulsion of the blood from the soft compressible tissues which is the case where the finished denture is under maximum stress in service without relief for the hard tissues and foramina from which issue the nerves and blood vessels. The denture will in use be compressed so as to rest on these which are more sensative that the soft compressible tissues. This will cause pain and discomfort, also act as a fulcrum to dislodge the denture.

If our impression material is not very plastic and not confined, greater pressure will be brought to bear where it advances to a direct seating as in the center of the vault and ridge crests than on a surface in direct ratio as it approaches the perpendicular to the applied pressure and becomes *nil* in undercuts. These are the very places as stated that should be taken advantage of for our retention and let us be sure that we *are* taking advantage of them. In them we usually find the most soft immobile tissue of our periphery, and by not modifying our cast we only take advantage of this by the amount of which is not always under the control of the operator, to an exact or known amount for the individual case.

The valve seal is secured by trimming the cast wide where it goes to a sliding seat and narrows in direct ratio as it approaches a direct seating.

The depth of the trim is governed by the amount of compressibility of the soft immobile tissues under maximum stress and the thickness of the soft tissues at the place of trimming. This is determined by careful digital examinations of the entire mouth to be covered by the denture as well as the peripheral outline. This should be placed just at the junction of the soft mobile and the soft immobile tissues.

Adaptation secured will give us equal pressure on the tissue only at the same pressure at which it was secured; greater pressure in the finished denture will have to be borne by the tissues the least suitable to stand this with comfort.

It should be seen that the securing of adaptation as desired should be the province of the artistic and scientific operation. That the amount of stress to be carried by a tissue should be determined by the operator with a full understanding that the anatomy, histology and function of the parts, rather than the varying mobility of an impression material as the eratic action or nervous tension of the patient's muscles.

As to the post dam we want the soft palate mechanically held up as high as it is possible, for it is to be drawn in coughing, speaking or any other muscular effort. This will show plainly the junction at the soft and hard palate, that the denture may be extended so that the velum will close the valve at this place and we run a direct seating twin at this juncture. The post dam is no part of the impression to be reproduced in the denture but cuts through the impression material and holds the velum up one-quarter in posterior to where the denture will extend. In testing out this and other methods of impression taking we found this one of the best. In over eight hundred cases with four operations to each case and each operator using a different method on that case, it was our experience that the best dentures that gave satisfaction to the patient, that resisted dislodgment with that quality inelegantly expressed by the term suction, was secured from impressions and casts that were scientifically and accurately trimmed than by any method whereby the impression was wholly depended upon. As evidence, the students of the institution with which I am connected, last year exhibited to the State Board (members of which are present), about thirty cases (one for each graduate), in which they had marked suction (or retention) in one hundred per cent. upper and ninety per cent. of lowers, and the record will be beaten this year. The ability of students unassisted on their final cases to secure their results would seem to place this method among the practical and scientific.

In conclusion we desire to say that we do not want the denture at any time to rest on the hard tissues; at all times to rest on the soft compressible tissues, and be sealed by the soft mobile tissues (not muscle), under more or less tension as to the rest or stress of the denture. In other words that a plate which is a perfect negative of a mouth at rest, and has been made from a perfect cast produced from a perfect impression, is as worthless a piece of construction as it is possible for a beginner to make. Let us state the reverse. A plate which is not the perfect reproduction of the mouth, but is made over a modified cast which has been made from a modified impression which was taken with the mobile tissues under tension, will show marked suction in either upper or lower plate as soon as any force attempts to displace it from its easy rest on the compressible tissues.

DR. HALL (closing): I guess that Dr. Hamilton has retired from the running. I don't think there is anything further to say other than that I feel very much gratified to think that I have converted him to my way of thinking. I think he already had his own ideas that were just as good as mine; perhaps they just happened to coincide with my ideas. In reply to Dr. Davis, I feel that I cannot express to him how I appreciate it. I frankly admit that he has said a lot of fine things, things that make me think, and I am surely making you think also. We are often mistaken. I think Dr. Campbell has gone along through this particular part of the country and reserved the right for me to change my mind. Some of my friends have told me that he has done so. Next year I may change my mind and agree with Dr. Davis. There is one point upon which it seems he misunderstood me when he spoke of trimming the impression. I did not intend to say that I trimmed the impression.

DR. DAVIS: It might be another term for relief—trimming it off to relieve.

DR. HALL: I relieve the hard areas by placing tin or lead or something over the cast. While I appreciate the results the Doctor is getting by trimming the casts, I feel that it is a practical impossibility to accurately determine the extent of the mobility and compressibility of the tissues and just where and how much you must trim this cast to get the desired pressure. How can he define the lines and the extent of trimming? With all respect, as I stated, for his good judgment and the data that he has brought before us; I still have that feeling that there is a certain amount of uncertainty connected with it; I do not see how it can be accurate. Why cannot we, Dr. Davis, get the same thing by the preparation of the tray? If we want a compressed area, add a little excess compound, heat it and put it in the mouth and know that we have exerted the proper pressure and accomplished the same result a little bit more accurately? Now I trust that I have made it clear in my talk that I attempt to do these things with the preparation of the individual tray accomplishing the same result that the doctor does by trimming. Our aim is the same. We are not disagreed, we are aiming at the same result. We want compression here and there, and relief here and there. I prefer, at the present time, to try to let the tissues aid me in this, rather than doing it with instruments on the cast. The point on disturbing nerve and blood supply with pressure is a good one. I feel that we have not spoken enough about atrophy of tissues that results from compression. Where we cause compression we are ultimately going to have atrophy that will equalize the pressure upon the tissues. The tissues of the human body will not tolerate compression. Take those of you that are wearing a ring; look at your finger. You have atrophy of the tissues because of the pressure of the ring. We insert a denture and compress the tissues; atrophy results and the tissues become equalized in their pressure. So to a great extent all of these things that we are utilizing for these very tight fitting dentures are only temporary. Atrophy accounts for the loosening of a plate after wear. We say the plate has lost its fit. Not at all; the jaw has lost its fit. We have this with which to contend with our patients: We fit the denture tightly and they come back in a couple or three months and are able to get the plate loose readily, whereas, when they left the office it was very diffcult to do so. And the patients hold us responsible for this changed condition. We haven't any control of the tissues. Personally I enter into a discussion and understanding with the patient and explain these conditions, show them the finger ring and explain that ultimately these plates are going to cause atrophy and the plate is going to become somewhat loose and that I have no control of this. That such is their misfortune and their loss. In that way I do not have the patients holding me responsible for these tissue changes. In conclusion I trust that Dr. Davis believes me when I state that I appreciated his discussion. It certainly was a good one, Doctor—I thoroughly enjoyed it. Your experience, the way you say you have worked, is most interesting. I wish I could spend a little while with you. I do not know when I have ever heard anything in artificial denture construction that has been so well given as the Doctor has related their experiences and his beliefs about these things. And let us again insist that it is not necessarily a technical scheme that we are trying to lay before you, that you must follow any particular way or person, but to understand the physics of retention and the mechanical relations that bring it about and then effect it the best way that you can in your own hands.

DR. WOODBURY: Wouldn't it be well to have the patient tell us his experience in the past week before we leave the subject?

THE PRESIDENT: That is a good idea if Mr. Elliott cares to.

MR. ELLIOTT: I didn't come here to make a speech. I came to show my teeth but I will say that I had a very pleasant week last week, very pleasant indeed. I had a little business over there, but we didn't tend to the business at all. I am very grateful to Dr. Woodbury for allowing me to be a patient; I appreciate it. I looked upon dentistry, Doctors, as a business where you went to the schools a while to learn how to get a dollar and a half or two dollars at a time—that it was simply a business. Now I take off my hat to dentistry and acknowledge that I believe now, I know now, that I was wrong; it is a profession. I was badly treated by a fellow who looked upon dentistry as a business, but, thanks to Dr. Hall, I have nearly as good a set of teeth as I had before. Don't think I am sacrilegous, don't think I am throwing boquets, Doctors—I am not, for this is coming from the heart; but I did not think that anybody but God could make as good a set of teeth as Dr. Hall did. You can't beat them. There was something said about the cost. You cannot buy them because they are part of me—no more than you could buy my hand or my foot; they are a part of me. There is another thing that interested me in last week's school as you men call it. I did not hear the matter of cost or the selling price of these things mentioned. I did hear them say that whatever you do, do it with a determination to achieve success in that particular line and the consideration—the money consideration, is entirely another matter. That is one thing where I got to believing that dentistry was not a business; it was a profession because it did not discuss those things. Another thing: I had an appointment with one of the doctors at 12:00 o'clock, and it was ten minutes to one when he got there. He scolded me for not coming on time to an appointment once, but he did not know that he had broken the appointment. There were two or three other doctors went in to dinner with us, and our soup was ordered, and they got so interested in their discussion over something—it is all Greek to me, I don't know a denture from a horse collar—but they were so interested that they didn't eat their soup. It was as delightful a week as I ever spent. When you want me as a patient I will leave my business and go. I thank you.

EDITORIAL

ORAL HYGIENE CAMPAIGN IN TENNESSEE

By legislative enactment, in Tennessee, last April, a Bureau of Oral Hygiene was created and added to the State Board of Health. The object of the Bureau is to disseminate the knowledge of oral hygiene among the people of the state, particularly the school children.

Doctor A. G. Buckner, Nashville, was made Director of the Bureau of Oral Hygiene and during the past year he has been organizing his force and giving as much publicity as possible to the Bureau, its aim, purpose and possibilities. He has personally appeared before teachers' institutes in the state, summer schools for teachers, state normal schools, meetings of county superintendents, etc., in order to acquaint the teachers with what is contemplated and enlist their sympathy and cooperation.

Regarding the matter he says: "I am pleased to report that everywhere I have been I have met with a most hearty and enthusiastic reception upon the part of the teachers of Tennessee. They are fully awake to a realization of the importance of the subject of mouth hygiene among school children and, with the proper leadership and aid from the dental profession, they stand ready to promote educational propaganda covering this subject in the schools of the state." The law authorizes the appointment in each county, of a reputable dentist who is to be known as County Mouth Hygienist, and who is to work without compensation, working in conjunction with and under the direction of the Bureau of Oral Hygiene. Other reputable dentists in each county are supposed to give all assistance possible to the County Mouth Hygienist in dissemination of the knowledge of oral hygiene.

Organized in this way the dentists of Tennessee have opportunity for doing a great work along the lines of oral hygiene and preventive dentistry that will be of great and lasting benefit to the people of that state.

Dr. Buckner further says: "The state owes as definite a relation to the health of its children as it does to their education and for this reason in course of time we shall have in Tennessee, not only a plysical examination of all school children, but a free clinic wherein all physical defects, such as defective vision, adenoids, diseased tonsils, diseased mouths and defective teeth will be cared for at the expense of the state."

Such a campaign as this is worthy the cooperation of every dentist and great good to the commonwealth should follow.

It would be well for dentists, in other states where no definite organization now exists, to look into this means of educating the public in oral hygiene, and have laws enacted making possible a similar organization in their states.

Such a campaign would result in immense benefit to the health of the people of our nation.

THE FEDERAL LAW PERTAINING TO FOREIGN-MADE INSTRUMENTS AND OTHER ARTICLES

It may be news to many of our readers that there is a federal law requiring the marking, branding, labeling or stamping of all articles of foreign manufacture or production *so as to indicate the country of origin.*

We call attention to this because it is a well-known fact that large numbers of instruments are coming from foreign countries, especially Japan and Germany, and it has been asserted that many imported instruments have had the stamping of the name of the "country of origin" removed from them.

The unfairness to various American manufacturers of dental and surgical instruments, and to dentists themselves, is apparent if the country of origin is removed from dental and surgical instruments. In buying instruments quality is the thing to be considered and not cheapness. A poor or inefficient instrument is *dear at any price.* In purchasing instruments see that they are made by reliable manufacturers. Do not buy any instruments unless the name or trade-mark of the manufacturer is stamped on the instruments themselves or the package containing them.

In accepting instruments that are in no way marked as to "origin," the dentist is taking a long chance and he should not complain if he finds them a worthless lot.

Here is a copy of the federal law relating to marking the "country of origin" on imported articles:

United States Tariff Act of 1913 Sec. 4, Par. F, Subsection 1.

That all articles of foreign manufacture or production, which are capable of being marked, stamped, branded, or labeled, without injury, shall be marked, stamped, branded, or labeled in legible English words, in a conspicuous place that shall not be covered or obscured by any subsequent attachments or arrangements, so as to indicate the country of origin. Said marking, stamping, branding, or labeling shall be as nearly indelible and permanent as the nature of the article will permit.

All packages containing imported articles shall be marked, stamped, branded or labeled so as to indicate legibly and plainly, in English words, the country of origin and the quantity of their contents, and until marked in accordance with the directions prescribed in this section no articles or packages shall be delivered to the importer.

Should any article or package of imported merchandise be marked, stamped, branded, or labeled so as not accurately to indicate the quantity, number, or measurement actually contained in such articles or package, no delivery of the same shall be made to the importer until the mark, stamp brand or label, as case may be, shall be changed so as to conform to the facts of the case.

The Secretary of the Treasury shall prescribe the necessary rules and regulations to carry out the foregoing provision.

Copy of the federal law relating to the removal of the "country of origin" from imported articles:

United States Tariff Act of 1913, Sec. 4, Par. F, Subsection 2.

If any person shall fraudulently violate any of the provisions of this act relating to the marking, stamping, branding, or labeling of any imported articles or packages; or shall fraudulently deface, destroy, remove, alter, or obliterate any such marks, stamps, brands, or labels with intent to conceal the information given by or contained in such marks, stamps, brands, or labels he shall upon conviction be fined in any sum not exceeding $5000, or be imprisoned for any time not exceeding one year or both.

PROMINENT DENTISTS PASS AWAY

As we go to press we learn of the death of Dr. Henry W. Morgan, Nashville, Tennessee, which occurred Saturday, January 17, 1920. Also of Dr. B. Holly Smith, Baltimore, Maryland, whose demise occurred, Thursday, January 22nd.

Obituaries will be published in the next issue of THE DENTAL SUMMARY.

GINGIVAL EXTENSIONS

BY JOSEPH HOMER, D.D.S., BOSTON, MASS.

To make abutments perpendicular and eliminate the perplexing dovetail for dentures:

A gingival extension consists of a pseudo-cast-metal wall or lamination, whose vertical section approaches a right triangle, with the hypotenuse approximating the approximal, lingual, or both approximal and lingual of a molar or premolar; the base resting on or clearing the gum. Anchorage is secured by extending a cavity to the buccal, occlusal and lingual surfaces. Gingival extensions are inlays-plus, inserted at right angles to the denture axis; crowns can be applied over them. Steps to support removable dentures may be added.

87 Milk Street.

REPORT OF STATE DIRECTOR OF ORAL HYGIENE

To His Excellency, A. H. Roberts, Governor of Tennessee,
and to the Tennessee State Dental Association:

Gentlemen:

Pursuant to, and in compliance with, Section four of Senate Bill 649, Chapter 172, of the Acts of 1919, I have the honor, as Assistant Secretary of the State Board of Health and Director of the Bureau of Oral Hygiene, to submit herewith my first annual report.

The act, under which I am operating was passed April 16th, and approved April 17th, 1919.

The first meeting of the State Board of Health, after the passage and approval of the Act, was held on May 10th, 1919. At this meeting the Board of Health, upon the suggestion of the Attorney General, decided that the Assistant Secretary and Director of the Bureau of Oral Hygiene, being a creature of that Body, should hold office at the pleasure of the Board. They further decided, by resolutions which were duly offered and adopted, that all accounts of this Bureau should be paid by vouchers, drawn by the Director on the Comptroller and approved by the Secretary and Executive Officer of the Board of Health. The Director of the Bureau was authorized to buy all necessary office furniture, supplies, etc., and to employ a stenographer. It was further decided by the State Board of Health that the office of the Assistant Secretary and Director of the Bureau of Oral Hygiene should be with the State Board of Health.

From a list of five names which, in accordance with the provisions of the Act, had been submitted to the State Board of Health by the State Board of Dental Examiners, I was elected to the position and immediately assumed office; but, owing to the fact that the State Board of Health was at that time quartered in a room in the Capitol building which was altogether inadequate for the accommodation of the large office force already employed, no attempt was made to inaugurate the work of the Bureau until the first of June, when more commodious quarters were provided for the Board of Health, at 405 Seventh Avenue, North. It will be noted from the above that I have, therefore, in fact only devoted three months to the promotion of the contemplated work.

My first effort has been to give as much publicity as possible to the Bureau, its aim, purpose and possibilities. In furtherance of this plan

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*Read before the Tennessee State Dental Society, Sept. 1919.

I am about to present the matter to the school teachers of the State, in order to acquaint them with what is contemplated and to enlist their sympathy and cooperation. I had the privilege of appearing before the teachers' institutes in Benton, Henry, Obion, Rhea, Bradley, Monroe, Blount, James, Hamblen and Anderson Counties; also before the student body of the summer school for teachers at the State normals in Memphis, Murfreesboro and Johnson City. I also addressed a meeting of the County Superintendents of West Tennessee, at Memphis, and was assured by them that they are in hearty sympathy and accord with the movement. Because of the fact that practically all county teacher's institutes in Tennessee were held during the two weeks from July 7th to the 21st, it was a physical impossibility to visit a greater number of them. I am pleased to report that everywhere I have been, I have met with a most hearty and enthusiastic reception upon the part of the teachers of Tennessee. They are fully awake to a realization of the importance of the subject of mouth hygiene among school children, and with the proper leadership and aid from the dental profession, they stand ready to promote educational propaganda covering this subject in the schools of the State.

Your attention is invited to the fact that by the Act, under which I am operating, I have the authority to appoint in each county a reputable dentist who is to be known as County Mouth Hygienist, and who is to serve without compensation, working in conjunction with and under the direction of this Bureau. Up to the present time I have made only twenty-one of these appointments. It has been my desire to obtain the most competent available man in each county. In this connection permit me to emphasize the fact that the appointment of some one dentist in each county as County Mouth Hygienist does not preclude the possibility of others of the profession rendering distinct service. Indeed it is presumed that the entire profession throughout the State will lend every possible aid to this worthy cause, and to this end criticism and suggestions concerning the conduct of the Bureau are most sincerely invited. As Director of this Bureau, I am expecting that every dentist in Tennessee will feel free to make any suggestion that may occur to him as pertinent. In fact, to make this work the success which it deserves to be, this must be the prevailing spirit. I am, of course, aware that, under the prevailing law and conditions, the possibilities are limited; yet with the earnest cooperation and sympathetic aid of the entire profession in the State, an immense amount of great and lasting good can be accomplished for the citizenship of Tennessee.

The State owes as definite a relation to the health of its children as it does to their education; and for this reason in course of time we shall have in Tennessee not only a physical examination of all school children, but a free clinic wherein all physical defects, such as defective vision, adenoids, diseased tonsils, diseased mouths and defective teeth will be cared for at the expense of the State. This will be profitable not only from an humanitarian standpoint but from a mercenary one as well, because a child who is physically unfit can not possibly be mentally fit, and it is folly to talk about compelling a physically-unfit child to attend school, as we do under the truant school law in Tennessee.

Then too a child who, because of physical unfitness, does not make his grades this year and is compelled to repeat the work next year, which he should have completed during last year is costing the State just twice as much as he would under favorable physical conditions. It, therefore, behooves the State to care for the health of her children as it does their education. Until this ideal condition prevails the next best thing is a liberal education of the child concerning the conservation of his health and, under existing laws in Tennessee, a wonderful opportunity is offered the dental profession to promote an educational campaign, covering the subject of mouth hygiene, among school children in the State.

An accomplishment which I consider especially noteworthy is the fact that the late Tennessee State Text Book Commission was induced to adopt as a supplementary text-book, for use in the third grade, "A Child's Book of the Teeth," published by the World Book Company, and edited by Doctor Ferguson, of New York. Through the efforts of the County Mouth Hygienists, in McMinn and Monroe Counties, this little book has been introduced to the schools of these counties. It is hoped that in course of time this primary text book will be in use in every school in Tennessee.

Appended hereto and made a part of this report is a statement of the expenditures of this Bureau from the time of its organization to the present.

EXPENSE OF BUREAU OF ORAL HYGIENE FROM JUNE FIRST TO SEPTEMBER FIRST

Paper and Printing	$ 101.80
Office Fixtures	309.00
Telephone and Telegraph Co.	11.97
Travel-Official Expense	162.25
Stamps	39.00
Salaries	1258.33
	$1882.25

The above items of expense are covered by vouchers accompanied by itemized statements and are of record in my office.

Respectfully submitted,
A. G. BUCKNER,
Assistant Secretary, State Board of Health and
Director, Bureau of Oral Hygiene.

Nashville, Tennessee, September 4, 1919.

CORRESPONDENCE

AN INTERESTING LETTER FROM DR. GEO. F. WOODBURY

The following letter was written to Dr. H. L. Ambler, Cleveland, who has given permission to publish for the benefit of Dr. Woodbury's many friends.

THE AMERICAN RED CROSS
COMMISSION TO SIBERIA

Vladivostok, Nov. 14, 1919.

Dear Dr. Ambler (and the rest):

It is just six months ago today since I left Cleveland. It is necessary for me to say, I have travelled thousands of miles in getting to my job.

In the first place I travelled half way around the world before I found a stopping place. Of course I stayed a few days or a week at various places, but the real stopping place was at Verthue Minsk, where I planned to open a dental clinic. This was after an attempt to reach Omsk. The train and personnel were held at Irkutsk. This was in July, about the 23d. A number of us were sent back to Verthue Udiresk to live with the 27th Regiment of U. S. Infantry. This was necessary because there was not enough room for all the Red Cross personnel at Irkutsk.

The Red Cross opened a "tent" dispensary at Verkhue Udiresk for civilian service. We were in the camp of the Twenty-seventh Regiment.

I did not have a dental outfit, but used the forceps I brought with me to do a little extracting. Later a hospital was opened down town, with one hundred and fifty beds. A dispensary was opened in connection with the hospital. I was to have space here.

I still did not have an outfit. I used my own instruments, just a few, for what little I was able do to. I had been promised a complete outfit, but it did not arrive and finally on September 20th, I was sent to Vladivostok to get a dental equipment.

At Verkhue Udiresk, it was as near home one way as the other. But the western "gate" is closed, and so I could not go that way if I had wanted to.

I was still without a job. I had to travel 2000 miles eastward, back to Vladivostok, before I found it.

I just mentioned that I was sent back here to get an outfit, but my job was found at the end of my journey, and so I am not to return to Verkhue Udiresk, but remain at Vladivostok.

Let me tell you, I have found a *real, real* job. The only one for my services in this whole country, and when I tell you about it you will agree with me, I am quite sure.

My "clientele" consists of nine hundred (900) children—on Russian Island—just across the bay from Vladivostok. The Red Cross hospital is located here.

The children are refugee children, brought from the Ural mountains district, where they had been for some time. Most of the children are from Petrograd. They left there when the revolution broke out.

The Red Cross decided to take charge of these children and when it was necessary to evacuate the western territory, west of Omsk—the children were loaded into box cars and sent four thousand miles to Russian Island. They are quartered in old barracks. They are from seven to sixteen years of age.

I began my work two weeks ago. Previous to this there had been a Russian woman dentist in charge; when she left the medical director appointed me in charge. There was some re-arranging of the office and several adjustments before I was ready for work. I was given a nurse assistant, one who had had school clinic work experience, in Seattle. My plan was this, and it met the approval of the Medical Director: to examine every child's mouth, and make a complete chart of its needs. This has not been done yet, because the blanks have not reached me. I made a form and gave it to the printer. This job is before me.

When I am ready I would like to call on the Cleveland Dental Society for volunteers to help in the examination. I cannot conceive of anything in dentistry, more interesting than this examination.

To be sure I have been working for the children and find among the hundred or more I've seen interesting data. There are some fine mouths and some very bad ones, as well as conditions of every description in between.

I think I will have nearly one thousand patients on my list, including children, teachers and personnel.

I was somewhat discouraged about my service in Siberia, but if I can keep on this job I will be satisfied. Some real construction work can be done here.

I must confess I did not enthuse over any dental service I saw up the line.

The weather has been very mild. Up to the present time there is no cold weather; a little ice, but no snow. It is quite as comfortable here in Siberia as it is in Ohio at this time of year.

My very kindest regards to all.

Sincerely,

GEORGE F. WOODBURY.

G. F. Woodbury, 1st Lieut.,
A. R. C., Siberia.

SUGGESTIONS

Conducted by F. R. Chapman, M.S., D.D.S., Columbus, Ohio

(*To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.*)

Impression Tray Toilet

After the tray has been cleansed in the usual manner, it lacks the finish and polish that we all desire to see. This may be restored to nearly its original luster without any scratches by the use of mineral wool. Use this mineral wool as you would a polishing cloth on any metal surface. The results of a little labor on your trays will please you.—*E. M. Brownson, Pacific Dental Gazette.*

Synthetic Fillings

Where one has to do a synthetic or oxyphosphate filling, and where it is impossible to use the rubber dam, paint the surrounding gum with dilute trichloracetic acid; this will stop the exudation of moisture from the gum, and work can then be carried out in a dry area without fear of having the filling spoiled by moisture.—*J. Levin, Commonwealth Dental Review.*

Inlay Restorations of Incisal Corners

In making a cast gold anterior corner restoration, cut an appropriate part of a celluloid tooth form, oil it, melt casting wax into it, then place in position on the prepared tooth and hold under pressure while the wax is cooling. Remove the celluloid form, and trim and polish the wax model.

If a pin is used for anchorage, attach a small amount of wax to the pin before placing it in the tooth, then place the form filled with wax in position, and finish as in the former case. This method results in accurate margins and a well-fitting inlay, and has proved a most satisfactory method of restoring incisal corners.—*E. G. Lee, Dental Cosmos.*

Proper Placing of Teeth

By setting the lower teeth directly over the lower ridge, and as close to the ridge as esthetics will permit, the stability of the lower denture is greatly increased. Taken bucco- or labio-lingually the center of any given lower tooth should be directly above the middle line of the lower ridge. When the lower teeth are placed in this manner the tongue is allowed ample room, and the buccal and labial muscles are prevented from exerting dislodging pressure on them in either speech or mastication. The objection may be raised here that upper teeth will be set an unnecessary distance outside of the ridge, due to the fact that the lower ridge is usually considerably larger than the upper. This is so, but the area of the upper affords greater possibilities for retention, and the upper denture rests on an immovable supporting member which more than offsets any increased leverage caused by setting the upper teeth outside of the ridge when this is necessary.—*Dental Digest.*

Vulcanite Dentures

Sometimes patients wearing vulcanite dentures require an impression for other upper dentures. If the impression be taken while the old denture is being worn, the new denture will doubtless be loose and less satisfactory than should be. Much better results will be obtained if the patient avoids wearing the old denture for twenty-four hours before the impression is taken. When a vulcanite denture is worn, the membrane of the mouth thickens. It remains thick as long as the plate is worn. In many cases, leaving the plate out for twenty-four hours will allow the membrane to return to nearly normal condition. If the impression be taken with the membrane normal, the model will be smaller, and the new plate made over it will fit tighter and better. This is especially true of upper dentures.—*The Dental Surgeon.*—*Dental Magazine.*

Capt. Teetzel's Method for Retaining Dentures in Flat, Hard Surfaces

For lower dentures make a groove about the thickness of an ordinary pin in depth and width around the model before packing about a millimeter from the edge of plate when finished, then after the flask is packed cut a strip of unvulcanized rubber about a millimeter wide and carefully cover the groove—by using a little chloroform on rubber it may be made to stick to plaster model; when properly completed a narrow ridge of soft rubber will come in contact with patient's gum tissue and form a cushion and suction. A similar proceeding may be used on upper case, but I have found a groove around the air chamber treated as above quite satisfactory. Another method is to pack a space two or three millimeters wide all around the ordinary air chamber. A lip can be made on this soft rubber around the air chamber by bevelling the edge of the air chamber metal and fastening on mould over a sheet of soft rubber cut quarter-inch larger than metal, and a hole cut slightly smaller than metal. Using above methods there is no need of failure in retaining dentures.—*Oral Health.*

To Give a Fine Polish to Gold

After scratches have been removed with pumice, nothing is so effective as oxid of zinc on a brush wheel. It leaves a beautiful lustrous polish.—*Oral Health.*

NEW PUBLICATIONS

Fractures and Dislocations of the Jaws. By Chalmers J. Lyons, D.D.Sc., Professor of Oral Surgery, Dental Department, University of Michigan. Toledo: The Ransom & Randolph Co., Pub., 1919. Price, postpaid, $2.00.

Dentists everywhere, especially those in the smaller cities and towns, should know something about the treatment of fractures and dislocations of the jaws, for these operations belong rightfully to the dentist or oral surgeon. Physicians as a rule resort to bandaging, with little or no attention to restoration of occlusion of the teeth. This may result in loss of good mastication and even disfigurement of the features. Dentists should be able to do this work, and if they are able to do it, many physicians will turn the cases over to the dentists or at least call upon them for assistance

Splinting, inter-dental ligating, etc., are things physicians know nothing about, yet in many cases they are all important in the treatment to obtain satisfactory results.

Do you feel competent to treat such cases should they be sent to you? If not, get a copy of Dr. Lyon's book and study it carefully. It is a practical exposition of the various means of treatment of fractures and every dentist who does not feel capable of handling these cases should study the book until he knows how.

The field of dentistry is broadening year by year and each year the demands on the dentist are greater than the year before. The progressive dentist must meet these demands and a good preparation is the only means of its accomplishment.

The edition of this work is limited. Better obtain a copy of the book while it is available.

Chapter I, is devoted to Dislocation of the Jaws; Chapter II, to fractures of the Jaws; Chapter III, to varieties of Fractures; Chapter IV, to Signs and Symptoms; Chapter V, to Diagnosis; Chapter VI, to the Process of Repair; Chapter VII, to Complications in the Process of Repair; Chapter VIII, to Prognosis; Chapter IX, to Treatment of Fractures; Chapter X, to Gunshot Fractures; Chapter XI, to Treatment by Bone-grafts; Chapter XII, to Anesthesia in the Reduction of Fractures.

The only work of the kind available, presenting all that is now known on the subjects treated.

Systematic Development of X-ray Plates and Films (Including Lantern Slide Making) By Lehman Wendell, B.S., D.D.S., Chief of the Photographic work, and instructor of Prosthetics and Orthodontia, College of Dentistry, University of Minnesota, Minneapolis. St. Louis; C. V. Mosby Co., Pub., Price, net, $2.00.

A most important thing in X-ray work is the development of the film to bring out the pathology of the parts that are rayed. A false step may spoil the negative and render the work valueless.

In this book Dr. Wendell considers the photographic phase of X-ray work, maintaining that the radiographer should be just as painstaking in the development of his pictures as the professional photographer if he hopes for uniformly good results. A film or plate that is bad photographically is more or less unreliable for diagnostic purposes. Many seem to think that proficiency in handling the X-ray machine is all that is necessary, the development of the exposed film or plate being so simple and automatic a process that it would be foolish for the operator himself to waste any time over it. But this is a mistake.

Dr. Wendell was an expert photographer before taking up the study of medicine and dentistry, and this experience and training have enabled him to write authoritatively on how correctly to develop X-ray plates and films. Dentists who do their own X-ray work will find this book of valuable assistance in obtaining good films for diagnostic purposes.

Practical Orthodontia. By Martin Dewey, D.D.S., M.D., formerly Head of the Department and Associate Professor of Orthodontia, in University of Iowa; formerly Professor of Dental Anatomy and Orthodontia, Kansas City Dental College; President of the Dewey School of Orthodontia. Fourth revised edition; St. Louis, Mo. C. V. Mosby Co., Pub., 1919. Price net, $5.50.

In writing this text-book, the author has given his attention to discussing the practical side of the subject, rather than the historical, in an endeavor to furnish a text of practical value to orthodontists, to students in dental colleges, and to teachers. Chapter I, is devoted to the subject of Occlusion; Chapter II, to Forces of Occlusion; Chapter III, Malocclusion; Chapter IV, Etiology of Malocclusion; Chapter V, Regulating Appliances; Chapter VI, Removable Regulating Appliances; Chapter VII, Anchorage; Chapter VIII, Retention of Teeth; Chapter IX, Impressions and Models; Chapter X, Use of the X-ray in Orthodontia; Chapter XI, Treatment of Cases; Chapter XII, Malocclusion and Nasal Deformities.

Those who are acquainted with the author, know that he is thorough in everything that he undertakes and the manner in which he has handled the text in this volume confirms that trait. He has given us the best text-book yet, written on this important branch of dentistry.

The text is illustrated with more than seven hundred engravings, and includes all that the author has deemed necessary to thoroughly cover the subject.

The book is well printed, on extra quality of paper, and is in keeping with other excellent text-books published by the Mosby Company.

Child Welfare, and the Teachings of certain Dentists, School Medical Officers, Medical Officers of Health, and other Medical Men. By J. Sim Wallace, D.S.C., M.D., L.D.S., formerly Dental Surgeon and Lecturer on Dental Surgery, London Hospital, London; Baelliere, Tindall and Cox, 8 Henrietta St., Convent Garden, W.C., 2, 1919. Price net, five shillings.

The author states that, fortunately, considerable attention is being paid now to child welfare; for it is felt that the great and unnecessary amount of disease and suffering which is afflicting the rising generation is an intolerable and disgraceful blot on the records of science and progress.

The waste in life and money, caused by disease itself, and the energy and time absorbed in the treatment of the diseases, directly and indirectly, resulting from preventable causes, are admittedly appalling, and make it particularly urgent that at least some restraint should be put on those who are specially instrumental in causing disease by their ignorance, apathy, and authoritative position.

He further says: "I trust the following essays may give satisfactorily the views of what has been called the modern school with regard to Oral Hygiene, and what would appear to be becoming the views of the modern school of medical men, interested in the prevention of disease in general."

The little book contains five chapters, the first, being devoted to Prophylaxis, at Different Ages; the second, The Principles of Dietetics; the third, Child Walfare and the Teaching of Specialists; the fourth, The Duty of the State towards the Early Environment of the Child; the fifth, Oral Hygiene and Physiological Secretions.

Too little attention has been given by dentists, in their offices, to the teeth of children. And they should realize that treatment alone does not keep a mouth in a hygienic state, and that the evil results of oral mal-hygiene may continue even after treatment unless preventive measures are practiced.

This little book is filled with helpful suggestions that every dentist should know, and if he is to serve his clientele to the fullest extent, he must institute in his practice that preventive treatment, that means so much for the physical welfare of our little patients.

SOCIETY·ANNOUNCEMENTS

Oklahoma State Dental Society

The next meeting of the Oklahoma State Dental Society will be held in Tulsa, Oklahoma, March 15, 16, 17, 18, 19, 20, 1920. This meeting will be conducted on the class system of post-graduate instruction.

The attendance will be divided into classes, by enrollment previous to the time of the meeting, and each class will take up the intensive study of one subject for the full week.

At this time the following teachers have been engaged:

Dr. Thos. B. Hartzell, Pyorrhea and Prophylaxis; Dr. Arthur E. Smith, Nerve Blocking and Anesthesia; Dr. Dayton D. Campbell, Full Dentures; Dr. F. E. Roach, Partial Removable Dentures; Dr. T. W. Maves, Inlays and Abutments for Vital Teeth.

These teachers will have assistants to help with the class work. The instruction will consist of lectures, technical and practical demonstrations. Ample facilities will be provided for clinical instruction and where possible the students of each class will be expected to do much of the practical work.

This meeting is one of a chain of meetings to be conducted by the Texas, Kansas, South Dakota and Oklahoma State Dental Societies. Any dentist, in good standing in his state society with 1920 dues paid, desiring to do so, will be permitted to attend the Oklahoma meeting provided the class of his choice is not filled by our own members.

The class fee is fifty dollars. The Bulletin of the Oklahoma State Dental Society which gives full information about our meeting, will be mailed to any one upon request.

C. R. LAWRENCE, *General Manager*,
Stephenson Bldg., Enid, Okla.

Michigan State Dental Society

The next annual meeting of the Michigan State Dental Society will be held at the Hotel Statler, Detroit, Michigan, April 12, 13 and 14, 1920.

The chairman on local arrangements is William H. Waller, 613 Washington Arcade, Detroit, Michigan, and the secretary, Claude S. Larned, 614 Post Building, Battle Creek, Michigan.

Annual Convention Texas State Dental Society

The Texas State Dental Society will hold its 40th annual convention March 8-13, 1920, at Dallas, Texas.

The special feature of this meeting will be post-graduate class courses conducted on the "Oklahoma Plan".

These classes will be conducted by the following well known men: Dr. Thomas B. Hartzell, Minneapolis, Minn;. Dr. F. Ewing Roach, Chicago, Ill.; Dr. Arthur E. Smith, Chicago, Ill.; Dr. Dayton D. Campbell, Kansas City, Mo. and Dr. T. W. Maves, Minneapolis, Minn. Other teachers may be employed.

J. G. Fife, *Secretary*,
736 Wilson Bldg., Dallas, Texas.

Pennsylvania State Dental Society

The Fifty-second Annual Meeting of the Pennsylvania State Dental Society will be held in the Rajah Theater, Reading, Pa., April 27, 28 and 29, 1920. An interesting and instructive program has been prepared. All ethical practitioners are invited to be present.

W. L. Fickes, *Secretary*,
6004 Penn. Ave., Pittsburgh, Pa.

Psi Omega Fraternity

The Reunion and convention of the National Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, July 12, 13 and 14, 1920.

Ohio Dental Convention Club

This organization was formed to encourage larger attendance at our national meetings. It was organized at Ohio dinner given in honor of Majors Heckard, Sherrard, and Eby at New Orleans.

Our secretary made our return much more enjoyable by his admirable arrangements of reservations, etc.

The club will run a special train from Cincinnati via Hamilton, Dayton, Columbus, Galion and Cleveland to Boston for this year's meeting which will be held the week of September 13th.

Everything will be arranged for club members, their ladies and guests. The arrangements will include transportation, Pullman reservations, taxies to the hotel, hotel reservations, sight-seeing trips, theatre parties, luncheons, dinners, sea-shore trips, and especial care and entertainment of the ladies.

Negotiations are now under way with the headquarters hotel for special rates for the first hundred. Better join us!

Write the secretary, Dr. E. S. Braithwaite, Willard, Ohio.

The president of the club is Dr. E. L. Pettibone; the vice-president, Dr. F. M. Casto.

Minnesota State Dental Association

The Thirty-seventh Annual Convention of the Minnesota State Dental Association will be held at the West Hotel, Minneapolis, Minn., on March 4, 5 and 6, 1920.

Max E. Ernst, *Secretary*,
1125 Lowry Bldg., St. Paul, Minn.

Rehwinkel Dental Society

The Ninth Annual Midwinter Meeting of the Rehwinkle Dental Society will be held at Chillicothe, O., Saturday, February 28, 1920.

P. PHILLIPS, *Chairman*, Local Committee.

Annual Congress of the American School Hygiene Association to be Held in Cleveland, February 24, 25, 26, 27, 28, 1920

The preliminary program of the 12th congress of The American School Hygiene Association to be held in Cleveland the latter part of February, has just been issued by its secretary, Dr. William A. Howe, of the State Department of Education, Albany.

This association is composed of prominent educators and health workers in various parts of America. The program as outlined will consist of nine one-half day sessions, beginning on Tuesday morning, February 24 and closing on Saturday morning, February 28.

All of the first day will be devoted to the consideration of Health Education. The entire second day will be devoted to School Health Service, including School Medical Inspection, Physical Education, School Nursing, and other activities under the general title of school health service. The session on Thursday morning will be devoted to Sex Education and Communicable Diseases. State Commissioner of Health, Freeman, of Ohio is listed as chairman of this section. Thursday afternoon is given to the subject of nutrition of school children, under the chairmanship of Dr. William R. P. Emerson, of Boston. On Friday morning seven papers on Mouth Hygiene will be presented by prominent dentists of this country and Canada. The full program of this section is given below. Friday afternoon will be devoted to Mental Hygiene, under the chairmanship of Dr. Henry H. Coddard, of Columbus, Ohio. The closing session on Saturday morning will be devoted to a symposium on the Relation of Health and School Authorities. Dr. Willard S. Small, of the U. S. Bureau of Education is chairman of this section.

The entire program is filled with much valuable material and will prove, in our opinion, the most constructive and progressive contribution of recent years to our literature of school health service.

It is earnestly hoped that the dental profession of the country will avail itself of the opportunity, not only to hear the section devoted to Mouth Hygiene, but many others of the congress.

Membership in the association, which includes a copy of the proceedings of the congress, is $3.00 a year. Let the secretary hear from you.

FRIDAY MORNING, 9:30—MOUTH HYGIENE

How can the National Dental Association aid in a program for better teeth and better health for school children.—Otto U. King, D.D.S., Secretary, National Dental Association.

Teaching of Mouth Hygiene to school children from the viewpoint of the Dental Journalist.—Rea P. McGee, M.D., D.D.S., Editor, *Oral Hygiene*, Pittsburg.

The Relation of good teeth, clean mouths, and good nutrition to good health, (with film "Come Clear").—Major L. G. Mitchell, U. S. A., Washington.

Oral Hygiene and its relation to all health educational activities.—Homer C. Brown, D.D.S., Ex-President, National Dental Association, Columbus.

How can school children be taught preventive dentistry?—Dr. Eudore Dubeau, D.D.S., Ecole do Sirurgie Fenvaire de Montreal.

Children's work in the Rochester Dental Dispensary and in the schools of Monroe County.—Harvey J. Burkhart, D.D.S., Director, Rochester Dental Dispensary.

Junior Red Cross and School Dental Ambulance Service in Rural Communities in Nassau County.—Walter J. Multer, Supervising Principal of Roslyn Public Schools, and Director of Junior Red Cross Dental Ambulance Service, Roslyn, L. I.

South Dakota State

The 38th Annual Meeting of the South Dakota State Dental Society will be held in Sioux Falls, March 29 to April 3, 1920. One week of post-graduate instruction will be given under the following clinicians: Dr. Arthur E. Smith, Chicago, Ill.; Dr. F. Ewing Roach, Chicago, Ill.; Dr. Dayton Dunbar Campbell, Kansas City, Mo.; Dr. T. W. Maves, Minneapolis, Minn.

DR. ERNEST W. ELMEN, *Secretary*,
608 S. F. National Bank Bldg.

Illinois State Dental Society

The Ffty-sixth Annual Meeting of the Illinois State Dental Society will be held in the Congress Hotel, Chicago, March 22, 23, 24 and 25, 1920.

The following essayists have been secured: Dr. Alfred C. Fones, Bridgeport, Conn.; Dr. Charles S. Essig, Philadelphia, Pa.; Dr. Wm. H. G. Logan, Chicago; Dr. Newton G. Thomas, Chicago; Dr. Hart J. Goslee, Chicago; Dr. F. E. Roach, Chicago; Dr. K. W. Knapp, Des Moines, Ia.; Dr. A. A. Herdliska, U. S. Public Health Service, Washington, D. C. A most cordial invitation is extended to all ethical practitioners in Illinois and neighboring States.

G. WALTER DITTMAR, *Pres.*
J. P. LUTHRINGER, *Secy.*

OHIO STATE SOCIETY

Members of the Ohio State Dental Society who have not yet paid their dues for 1920, should do so immediately in order to receive the Summary and the *Journal of the National Dental Association* from the first of the year.

Members of the Society who were in service during the war, and whose names do not appear in the program, are requested to report the fact, with respective rank, to the secretary of the State Society.

Any such members who were not present at the recent meeting of the State Society may secure one of the souvenir badges by addressing the secretary.

Committees for 1920

Ad Interim Committee of the Board

C. W. Mills H. M. Semans C. H. Schott
F. R. Chapman A. O. Ross Harry Cope
E. C. Mills L. P. Bethel F. M. Casto

Publication

F. R. Chapman, *Chairman*
305 Schultz Bldg., Columbus
L. P. Bethel, Editor W. G. Hamm

Program

L. P. Bethel, *Chairman*,
185 E. State St., Columbus
W. H. Whitslar H. E. Germann

Clinic

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458 Rose Bldg., Cleveland
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And the President of each Component Society

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And the Treasurer of each Component Society

History

C. I. Keely, *Chairman*
Hamilton, Ohio
G. D. Edgar F. M. Pursell

Library

E. C. Mills, *Chairman*
151 E. Broad St., Columbus
H. T. Smith C. H. Martin

The Component Societies of the Ohio State Dental Society

(This list of Officers is compiled from information furnished by the Secretaries of the various Components, where incorrect it is due to lack of information relative to elections. Secretaries are requested to keep the list correct by notifying the secretary of the State Society or the Editor of The Dental Summary of the result of elections.)

22 Butler County Dental Society, meets 3d Friday. each month.—Pres., P. A. Krucker, Hamilton, V. Pres., E. E. Meisterhaus; Sec.-Treas., F. T. Craven, Hamilton.

10 Central Ohio Dental Society, meets 1st Wed., Feb., May and Oct.—Pres., O. M. Young, Marion; Vice-Presidents, Frank Burger and F. P. Leonard; Rec. Sec. D. G. Welch; Cor. Sec., F. R. Mann Marion; Treas., F. C. McGaughy.

27 Cincinnati Dental Society, meets 3d Friday. Pres., R. W. Taylor; V. Pres., W. Foster; Rec. Sec., P. Cassidy; Cor. Sec., C. H. Stricker; Treas., J. D. Gordon.

6 Cleveland Dental Society, meets 1st Monday, Pres., I. M. Saum; V. Pres., J. A. Loughry; Rec. Sec., S. F. M. Hirsch; Cor. Sec., F. M. Casto, 458 Rose Bldg.; Treas., E. D. Phillips.

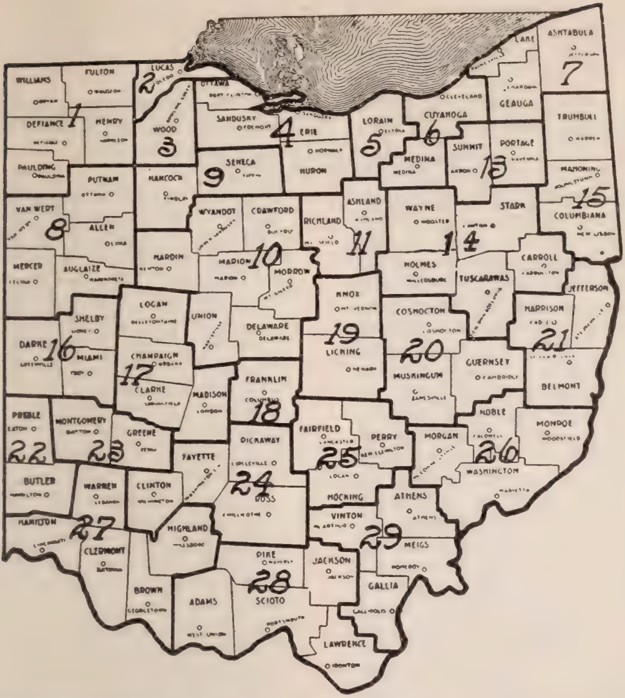
18 Columbus Dental Society, meets last Tuesday, Pres., D. P. Snyder; V. Pres., F. L. Gruber; Rec. Sec., E. N. Hoopman; Cor. Sec., F. C. Starr; Treas., A. O. Ross.

15 Corydon Palmer Dental Society, meets 2d Thursday, April and Oct.—Pres., J. F. Steele, Lisbon; V. Presidents, T. J. Evans, J. H. Chessrown and G. L. Moore; Rec. Sec., J. T. Williamson; Cor. Sec., W. B. Challis, Lisbon; Treas., J. K. Nash.

21 Eastern Ohio Dental Society, meets 1st Thursday, May and October—Pres., C. S. Starkweather, Bellaire; First V. Pres, L. B. Peterson, Steubenville; Second V. Pres., George Sharp, Flushing; Cor. Sec., J. K. Hunter, Bridgeport; Rec. Sec., H. A. Smith, Steubenville; Treas., S. C. Hasbronck, Barnesville.

9 Hancock - Seneca Counties Dental Society, meets 2d Wednesday.—Pres., A. C. Cole, Fostoria, V. Pres., ———; Rec. Sec., E. V. Burns, Findlay; Cor. Sec., A. E. Mann, Findlay; Treas., V. H, Michener.

25 Hocking Valley Dental Society, meets 1st Monday.—Pres., J. J. Stukey; Vice Pres'ts., C.F.Acker; and W. M. Scott; Sec., R. H. Wetzel, Lancaster, Treas., D. P. Vosper.



5 Lorain County Dental Society, meets 1st Tuesday, Feb., Apr., Sep. and Nov. Pres., F. A. Newhall, Lorain; V. Pres., C. J. Love; Sec., J. G. Wherry, Elyria; Treas., J. E. Trombley.

17 Mad River Valley Dental Society, meets 2d Monday, bi-monthly.—Pres., E. Dibert, Springfield; Vice Presidents., A. E. Bible and H. Houser; Rec. Sec., H. H. Krapp; Cor. Sec. W. B. Seward; Treas., E. V. M. Thompson.

1 Maumee Valley Dental Society, meets 2d Tuesday, June and Oct.—Pres., N. A. Cunningham, Defiance; V. Pres., A. S. Blake; Rec. Sec., S. D. Potter; Cor. Sec., O. J. Wisman, Delta; Treas., J. A. Benner.

23 Miami Valley Dental Society, meets last Monday. Pres., H. C. Huffman; V. Pres., H. L. Oliver; Cor. Sec., H. M. Brewer; Rec. Sec., W. B. MacBain; Treas., J. R. Arthur; J. M. Chase; representative to the State Dental Society.

20 Muskingum - Coshocton - Guernsey Counties Dental Society, meets 2d Thursday, Jan., May and Sept.—Pres., P. F. Walker, Coshocton; V. Prests., A. W. Boyd and T. E. Axline; Sec., J. A. Honabarger, Warsaw; Treas., H. J. Boyd.

4 North Central Ohio Dental Society, meets 3d Wednesday, Jan. Apr., July and Oct.—Pres., A. G. Thatcher, Fremont; Pres. Elect., E. S. Braithwaite, Willard; Vice-Pres., H. S. Rogers, Sandusky; Rec. Sec., D. D. Smith; Cor. Sec. J. H. Billmeyer, Norwalk; Treas., L. F. Meyer.

7 Northeastern Ohio Dental Society, meets 2d Monday —Pres., H. O. Frederick, Ashtabula; V. Pres., O. T. Battles; Sec., R. J. Goggin, Ashtabula Harbor; Treas., R. J. Goggin.

8 Northwestern Dental Society, meets 4th Wednesday.—Pres., A. Jones, Lima; Vice Pres'ts., J. R Cannon and I. W. Wright; Sec. J. W. Dimond Lima; Treas., J. K. Bannister.

29 Ohio Valley Dental Society, meets 2d Wednesday, Apr and Oct —Pres. M. D. Hartinger, Pomeroy; V. Pres., R. B. Church; Sec., C. S. Shumaker, Pomeroy; Treas., J. B. Hodge, Middleport.

24 Rehwinkel Dental Society, meets 3d Thursday. Pres., A. M. Bush; V. Pres., O. A. Thompson; V. Pres., C. H. Martin; Sec., F. D. Wollard, Washington, C.H.; Treas., C. V. Laam.

11 Richland-Ashland Counties Dental Society, Meets last Monday. Feb., June and Oct.—Pres., B. W. Livingston, Ashland; V. Pres., J. H. West- Rec. Sec., I. R. Suter; Cor. Sec., J. F. Clark, Mansfield; Treas., E. F. Cleland.

26 Southeastern Ohio Dental Society, no report

28 Southern Ohio Dental Society, meets, 3d Monday. May and Oct.—Pres., W. H. Johnson, Waverly V. Pres., A. S. Adams; Sec., C. E. Beatty, Portsmouth; Treas., E. O. Buchanan.

12 Stark County Dental Society, meets 3d Wednesday—Pres., C. O. Carr, Massillon; V. Pres'ts., B. H. Bowman and J. G. Foltz; Rec. Sec., C. A. Allensworth; Cor. Sec., F. M. Lose, Massillon; Treas., F. M. Lose.

13 Summit County Dental Society, meets 1st Friday. Pres., J. T. Connors, Akron; V. Pres.,———; Rec. Sec., H. G. Haas; Cor. Sec., F. S. Butler, 2d Nat. Bank Bldg., Akron; Treas., A. S. Butler.

2 Toledo Dental Society, meets 3d Friday. Pres., T. S. Shaw; V. Pres., H. W. Hisey; Sec., L. C. Jackson, 2205 Ashland Ave.. Treas., C. H. Cox.

30 Tuscarawas County Dental Society (a new society) meets 2d Tuesday. Pres. A. W. Davis, Dover; V. Pres., F. H. Waldron; Sec. and Treas., E. S. Wagner, Dover.

16 Western Ohio Dental Society, meets 1st Thursday, Feb., May and Oct.—Pres., A. A. Davis, Troy V. Prests., P. G. Eddy, J. J. Little and V. E. Bedford; Sec'y-Treas., F. A. McCullough, Troy.

3 Wood County Dental Society, meets 2d Wednesday.—Pres., B. D. Roe. Bowling Green; V. Pres., R. E. Milbourn; Sec., T. M. Lea, Bowling Green; Treas., E. R. Beatty.

19 W. D. Miller Dental Society, meets 2d Thursday. May and Oct.—Pres., W. S. Deely. Mt.Vernon; V. Pres., H. S. Barrick; Rec. Sec., L. E. Davis; Cor. Sec., E. V. Prior, Newark; Treas., W. B. Grossman.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

A letter came to me the other day that would be discouraging if my stuff were being written for fame or glory, rather than in a more or less honest effort to do some little good as I go along. The writer wanted to know if I didn't know that the war ended last November, and didn't I think it was about time to stop talking about it and let the wounds heal over, so that the world might get back again to its comfortable before-the-war commercial condition of letting well enough alone. And just after I read that letter I went down to the street, and the first human being that I saw was a young fellow sliding along the pavement as best he could seated on his hams, both legs being off just below the thighs. He had contrived, or somebody had contrived for him, a sort of leather sole on which he sat, while he wriggled and writhed along, helping himself with one hand and the stump of the other one. And I spoke to him, asked him how it happened; and it appeared that he had been gassed to boot. And somehow that letter lost all its sting; and when I came back to my machine the first thing I did was to put a sheet of paper between the rolls and write the following:

COMPENSATION

Austria is starving.

There is no fuel.

Appeals for help are loading every American mail.

We are told that, unless Great America opens her heart and pours out her wealth, thousands upon thousands must perish of cold and hunger.

And America, being generous to the point of extravagance, is helping, is doing much more than there is any reason to expect her to do. But—

America and Americans cannot forget, do not want to forget, that Austria and Austrians were part and parcel of the most fiendish plot, the most wide-reaching scheme of starvation, pillage, rapine and murder ever conceived by the mind of semi-savage man.

That Austria not only gladly followed the lead of the Maniac Emperor, but that she originated the scheme that led to the rape of Belgium, the massacre of Roumania, and all the senseless, ruthless devastation and butchery that followed.

That the people of Austria, not alone the rulers, were steeped to their eyes with the lust for conquest, for the subjugation, the wiping-out of other peoples with whom they had no quarrel; and that America was included in the list of nations that were to be made to feel the iron heel of devastating war; and that these people, in mobs and thousands, gathered around the consulates of foreign powers in Vienna, hooting, insulting, demanding War-War-War!

Austria, no less than Germany, had in mind the carrying out of plans that should stop at nothing but the complete subjugation of the world; and in this scheme the people were no less responsible than their rulers.

To be sure, the scheme failed; to be sure, Austria and Germany did not succeed in starving the world into submission. But—

There is a well-recognized Law of Compensation that always works; it never goes on strike for reduction of time, but works day and night; and this Law takes Motive into account to a much greater extent than Act. Austria did not starve the world; but she meant to do it if she could, and she is today responsible for that motive, that intention, and is reaping precisely and only what she has sown.

Austria is starving; Germany is starving; both are on the brink of such anarchy as history must shrink to record. But—

These conditions, awful as they are, pitiful as their results are very likely to be, are positively and entirely the fruits of the tree of their own planting.

They have sown the teeth of dragons, and their own feet must be torn thereby. The great Law of Compensation is still "on the job."

And now I want to say that, while the war may be over, its effects are here; and that we Americans will do well to be in no hurry to forget it.

There is another thing that we are in danger of forgetting—the debt we owe to those who "went over" and did our fighting for us. Now that the danger is over, and we've forgotten our scare, we are in grave danger of forgetting our vows and our duty to the thousands of young men whose lives were largely ruined by the ambition of the Hun to rule the world. Every one of us ought to pray, with Dickens, "Lord, keep my memory green."

Dr. W. A. McCready, of Pittsburg, has been appointed to succeed Dr. H. W. Arthur, of the same city, as member Pennsylvania Board of Examiners. Dr. T. A. Hogan, also of Pittsburg, was reappointed.

The Columbus Dental Mfg. Co. has completed plans for a large addition to its factory.

The Oklahoma state industrial school for girls is rendering first-class dental service to its 88 inmates.

The New DuPont Ether

Effect on Post Nausea Analgesic Properties

An important development in the field of anesthetics during the past month is the announcement that the new type of ether based on the work of Dr. James Cotton of Toronto is now being prepared on a commercial scale.

The new anesthetic, which is a highly refined di-ethyl ether, modified by the addition of gases, has the following characteristics: (1) The property of inducing and maintaining anesthesia with practical freedom from post-operative nausea, and, (2) the property of inducing and maintaining analgesia as distinguished from anesthesia.

The numerous tests which have been conducted with the new ether at various hospitals and clinics indicate that aside from its value in ordinary surgical practice, its analgesic properties open up an entirely new field in the large class of operations which are now performed with a local anesthetic or without any attempt whatever to eliminate pain.

The most obvious of these are in obstetrics where only a small amount of this special type of ether is required to relieve pain without at all interferring with the progress of labor, and in dentistry where it can be used to render painless such operations as nerve treating, removal of roots and the excavation and filling of teeth. Its administration requires no speical procedure, although it is desirable, as with ordinary ether, to use efficient and scientifically correct apparatus in which the ether vapor concentration can be closely controlled.

The Professional Man's Income Tax

The present Income Tax law requires that returns for 1919 be filed on or before March 15, 1920, at the office of the Collector of Internal Revenue for the district in which the taxpayer lives. At least one quarter of the tax due must accompany the return.

An unmarried person must file a return *if his or her net income was $1000 or over;* and a married person living with wife (or husband) must file if their joint net income was $2000 or over. A widow or widower, or a married person living apart from wife (or husband) is classed as a single person.

The requirement to file a Federal Income Tax return is not contingent upon there being a tax due.

Form 1040A is used for net income of not more than $5000; Form 1040 for net income over $5000. Instructions and a working sheet accompany each return form.

Every firm of professional men operating as a corporation must make an annual return of net income on Form 1120; if operating as a partnership, a return on Form 1065 must be filed.

GROSS INCOME

An individual's gross income from a profession includes all compensation for his services.

Where services are paid for with something other than money, the fair market value of the thing taken in payment is the amount to be included as income. If the services were rendered at a stipulated price, in the absence of evidence to the contrary such price will be presumed to be the fair value of the compensation received.

In the case of a salary received, this should be shown separately, in Block B, of the return. Many professional men and women are officers or employees of a State, city, town or county. Their salaries or wages as such officers or employees is exempt from the Federal Income Tax.

As to fees for services to patients, etc., these should be included in the gross income for the taxable year in which received, unless they are included when they accrue to him in accordance with an approved method of accounting followed by him.

A professional man may make his return on the basis of cash intake and actual expenditures for the year. It should be noted here that a taxpayer is deemed to have received income which has been credited to or set apart for him without restriction.

A more exact and equitable method of figuring net income is on the "accrual basis." This means a computation on the basis of income earned and expenses incurred, whether paid or not, that actually pertain to the taxable year, excluding income earned and expenses incurred in previous or succeeding years. A professional man who keeps books of account should make returns by this method, if his accounting method is one generally employed, and shows a correct net income.

DEDUCTIONS

A professional man may claim as deductions the cost of supplies used by him in the practice of his profession, expenses paid in the operation and repair of an automobile used in making professional calls, dues to professional societies and subscriptions to professional journals, the rent paid for office rooms, the expense of the fuel, light, water, telephone, etc., used in such offices, and the hire of office assistants. Amounts expended for books, furniture and professional instruments and equipment of a permanent character are not allowable as deductions.

In the deductions from gross income, the law specifically bars personal living or family expenses.

In the case of a professional man who has a regular place of business and who rents a residence, but incidentally receives there clients, patients or callers in connection with his professional work, no part of the rent at his home is deductible. *If, however, he uses part of the house for his office, such portion of the rent as is properly attributable to such office is deductible.*

BAD DEBTS

The uncollectible bills of professional men, particularly doctors and dentists, have a very important bearing on the net earnings for each year. The principal point in connection with such accounts made in Income Tax procedure is that there can be no allowance for such bad debts in returns figured on the "cash basis." That is, a person who has been making his annual returns on the basis of cash received and actual cash expenditures each year has never shown as income his accounts with patients or clients, and is, therefore, not entitled to take them out of income.

On the other hand, a person who annually figured his gross income on the "accrual basis," that is, included his cash receipts and charges against patients and clients for all of his services performed during each year, is entitled to a deduction for "bad debts" covering such accounts as he ascertained during the year were uncollectible and charged off on his books.

An account merely written down or a debt known to be worthless prior to the beginning of the taxable year is not a proper item for deduction.

WEAR AND TEAR

A reasonable allowance for the wear and tear and obsolescence of such instruments and equipment, etc., is allowed. The proper allowance is that amount which should be set aside for the taxable year in accordance with a consistent plan by which the total of such amounts for the useful life of the property will suffice, with the salvage or scrap value, at the end of such useful life, to provide in place of the property its cost or its value as of March 1, 1913, if acquired by the taxpayer before that date.

OBSOLESCENCE

When through some new invention, or radical change in methods, or similar circumstance the usefulness in his profession of some or all of his instruments or other equipment is suddenly terminated, so that he discards such assets permanently from use, he may claim as a loss in that year the difference between the cost (reduced by reasonable adjustment for wear and tear, which it has undergone) and its junk or salvage value. If the apparatus was owned prior to March 1, 1913, its fair market value on that date should be considered, instead of its cost, in figuring obsolescence. This deduction is allowed by law, but the taxpayer must be able to substantiate any claim made on this basis.

Despite the tremendous advances of American dentistry during the past decade, the teeth of Americans never were in such poor condition as right now; and never was there such great and pressing need for more dentists and better dentists, more dentistry and better dentistry.

No very great prophetic powers are needed to predict that the time is coming when direct personal service will have become the only basis for salary, wages, fees—income of any sort. In view of such a probability, what better service can a dentist render to his son than to give him a thorough grounding in his own profession, while still under the parental care, to be completed later by a thorough college course? It is an old saying that: "It is well for a son to follow his father's calling," a saying that seems to apply particularly well in this case.

New and More Liberal Insurance Benefits for Ex-service Men Effective December 24, 1919

Under the new Amendment to the War Risk Insurance Act, which became a law on December 24, 1919, war term insurance or Government life (converted) insurance policies may be made payable to any of the following list of beneficiaries:

Parent, grandparent, stepparent, parent through adoption, wife or husband, child, grandchild, stepchild, adopted child, brother, sister, half-brother, half-sister, brother through adoption, sister through adoption, stepbrother, stepsister, uncle, aunt, nephew, niece, brother-in-law, sister-in-law, a person who has stood in the relation of a parent to the insured for a period of one year or more prior to the insured's enlistment or induction, the children of such person; parent, grandparent, stepparent or parent through adoption of the insured's wife or husband.

United States Government life (converted) insurance may now be paid at death in a lump sum or in installments for 36 months or more, at the option of the insured.

The rate of compensation for disability has been greatly increased. A comparison between the amounts formerly granted under the War Risk Insurance Act with those provided by the new law follows:

Temporary Total Disability	W. R. I. Act	As Amend'd
With neither wife nor child	$30	$ 80
With wife but no child	$45	$ 90
With wife and one child	$55	$ 95
With wife and two children	$65	$100
With wife and three or more children	$75	$100
With no wife but one child	$40	$ 90
With no wife but two children	$50	$ 95
With no wife but three children	$60	$100
*With no wife but four children	$60	$105
Extra allowance for dependent mother of dependent father or both	$10 ea.	$10 ea.

*Under the new law there is an allowance to a man temporarily totally disabled, and with no wife living, of $5 additional for each child (in excess of one) without limit as to number.

TOTAL AND PERMANENT DISABILITY AS AMENDED

Under the War Risk Insurance Act the same scale applied for total and permanent disability as for temporary total disability. A distinction is made between the two in the new law. Under the latter the compensation monthly for total and permanent disability is $100.

Under the new amendment if the disabled person is so helpless as to be in constant need of a nurse or attendant, an additional allowance is provided, in the discretion of the Director, not exceeding $20.

Both under the W. R. I. Act and under the new law, compensation for the loss of both feet or both hands or the sight or both eyes, or for becoming helpless and permanently bedridden is $100.

In addition, the new law provides that compensation for the loss of one foot and one hand, or one foot and the sight of one eye, or one hand and the sight of one eye, shall be $100.

The new law provides that for double, total, permanent disability the rate of compensation shall be $200.

**The new law provides that each of the impairments mentioned shall be deemed to be total, permanent disability.

PARTIAL DISABILITY: The new law provides:

"If and while the disability is rated as Partial and Temporary, the monthly compensation shall be a percentage of the compensation that would be payable for * * total and temporary disability, equal to the degree of the reduction in earning capacity resulting from the disability * * ."

"If and while the disability is rated as Partial and Permanent, the monthly compensation shall be a percentage of the compensation that would be payable for * * total and permanent disability equal to the degree of the reduction in earning capacity resulting from the disability * *."

In no case is compensation payable for a reduction in earning capacity rated at less than ten per cent.

SPECIAL REINSTATEMENT RULING

You may reinstate your War Term Insurance within three months after the month of your discharge by mailing two months' premiums to the Bureau of War Risk Insurance without a written application or statement as to health.

Free Dental Service

For Ex-Service Men—Examiners Appointed

The Surgeon-General of the United States Public Service is appointing County Examiners whose duty it is to render all necessary dental treatment to former soldiers at government expense. All ex-soldiers who come under the following classification are entitled to such treatment as may be necessary, without cost to them:

Class 1.—Those patients who have lost teeth or portions of either maxilla or mandible through gunshot wounds or other injuries received in line of duty, shall have restorations and whatever other dental treatment necessary to put the mouth in the best condition possible.

Class 2.—Those patients whose physical disability is directly due to pathological oral conditions shall have whatever dental treatment that is necessary to place the mouth in a healthy condition and insure a good masticating surface.

Class 3.—Those patients, the relief of whose disability is retarded by pathological oral conditions shall have whatever dental treatment that is necessary to place the mouth in a healthy condition.

Class 4.—All patients who are shown to have lost teeth while in the service other than mentioned in class one shall have same replaced with vulcanite dentures or bridge-work.

Class 5.—All patients of the bureau of war

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offers a definite, dependable service to the Dental Surgeon in his operative work. The care exercised in the manufacture of Listerine insures a uniformity in preparation which may be relied upon to produce like results under like conditions.

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has an agreeable, refreshing taste, and this, combined with its well-proven antiseptic properties, makes it a most acceptable solution for use as a spray or wash prior to and after operations on the teeth or gums.

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possesses a two-fold antiseptic effect. After evaporation, a film, consisting of boric and benzoic acid, with baptisia tinctoria remains on the surface to which Listerine has been applied.

A small quantity of Listerine evaporated from a watch glass, or other suitable container, will disclose a residue of these beautiful crystals in abundance, as Listerine is a saturated solution of boric acid.

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will regret to hear that it has gone up. But don't be scared; it has not gone off the market. O no, nothing so awful as that! On the contrary, it is on a boom. It has only gone up in price, from $1.50 to

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of 9¼ lbs.

Thus it will cost the dentist about four cents more to insure correct adaptation of plate; which it is SURE to do if impression was correct.

Stewart J. Spence, *Mfr.*

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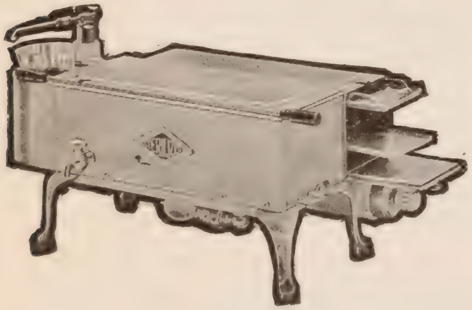

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risk insurance whose teeth are shown to have decayed while in the service shall receive such treatment as is necessary.

To obtain this service the person so entitled should communicate with the district supervisor, attention supervising dental surgeon, treasury department, United States public health service, Cincinnati, O., who will make an investigation of the case and if the person making the request is found to be entitled to the service he will be directed to report to the dental examiner nearest his home.

So far as possible ex-service men are being appointed. Appointments reported to date:

OHIO—Dr. O. G. Stephenson, Marion, Marion county; Dr. Charles Bratton, Galion, Crawford county; Dr. J. P. Brooks, Richwood, Union county; Dr. G. S. Evans, Upper Sandusky, Wyandot county; Dr. William E. Knight, Delaware, Delaware county; Dr. C. Jensen, Mr. Gilead, Marrow county, and Dr. C. C. Patten, Kenton, Hardin county.

INDIANA—Dr. C. C. Bonnhill, Lafayette; Tippecanoe county.

If the names of appointees are forwarded to THE SUMMARY we shall be glad to publish them.

"That Old Sweetheart of Mine"

We cuss her. We abuse her. She isn't pretty, and she is in awful bad taste. We have used her when we should not and we have passed her up when she needed us and when we needed her. We have spoiled many beautiful faces with her, and we have ruined many good ones upon each side of her. Many sore spots have we made with her, and many aching pains have we soothed with her. The coons like her and the ruebens fall for her. When used right she is a jewel—when abused a nightmare. Many are the days when the landlord wants the rent, or the kiddies a new pair of shoes, or the meter has to be fed and we haven't the wherewith; and, lo and behold! in she walks and says "put her there," and there she is put, and we love her all the more. In the days of our youth she was our chief assistant, and many are the times when she has come in and helped us to make that payment upon that new chair, and likewise many are the times when we were at our wits end to make that filling stay, and she came in and helped us, and she also brought a few more dollars to ease our despair. Treat her right, boys; it's never too late to mend; don't abuse her and don't throw her down, and always remember *that old gold crown.*

P. S. COLEMAN, Wilburton, Okla.

Peoria, Ill., Board of Education is using motion-picture films to interest pupils in dentistry.

Mr. and Mrs. Daniel Young Nichols, of Cincinnati, announce the marriage of their daughter Nancy Belle to Dr. Fred Holloway Hood, on Saturday, December 27, 1919.

The young people are "at home" at 723 Michigan Avenue, Adrian, Michigan. Here's hopin'.

National Capital Society

Washington, D. C., Dec. 15.—At a recent meeting of the National Capital Dental Society the following officers were elected: Manly Michaels, president; Charles W. Cuthbertson, vice-president; Starr Parsons, secretary; C. Willard Camalier, corresponding secretary; John E. Black, treasurer; Nora Moyer, librarian; Emory Bryant and C. W. Cuthbertson, delegate and alternate to the National Dental Association.

The total of the donations given by George Eastman, of Kodak fame, to the Massachusetts Institute of Technology, now foots up $10,000,000.

Following is a list of Mr. Eastman's large contributions:

Massachusetts Institute of Technology, plus	$10,000,000
Stock of Eastman Kodak Company to employes	6,000,000
Eastman School of Music	4,000,000
Rochester Dental Dispensary	1,500,000
National Association of Audubon Societies	2,000
Yerkes Observatory, University of Chicago	3,000
Musical instruments for public schools	15,000
Y. W. C. A. and Infants Summer Hospital	25,000
Shelter of Children's Society	45,000
Rochester Friendly Home	50,000
Stevens Institute of Technology, Hoboken, N. J.	50,000
Science Building, University of Rochester	75,000
Homeopathic Hospital	75,000
Rochester Parks	100,000
University of Rochester Endowment Fund	100,000
Hahnemann Hospital	100,000
State and Municipal Research Bureau	162,000
War Relief	225,000
Red Cross of 1917	250,000
Y. M. C. A.	300,000
Tuskegee Institute	362,000
Mechanics Institute	375,000
For enlarging Rochester Venereal Hospital	500,000
University of Rochester Fund for Women's College	500,000
War Chest of 1918, plus	500,000
Expenses of War Chest	100,000
Chamber of Commerce building	575,000
Addition to Chamber of Commerce building, estimated at	750,000
Total	$26,739,000

Dr. L. E. Custer Stricken

With profound regret we learn that our good friend, Dr. L. E. Custer, of Dayton, Ohio, suffered a light paralytic stroke, December 9th. At last accounts he was improving; and expected to be about again shortly.

Dr. Custer is not only widely known in Dayton and Ohio, but all over the United States. For many years he has been a regular attendant upon the meetings of the state and national societies and by his associates is regarded as one of the most learned and capable men in the profession. Besides he has been an aeronautic enthusiast for many years, being one of the first ballonists. He has been an entrant in the international ballon races several times. In addition he is regarded as an inventive genius, having perfected many devices used by members of his profession and others.

Oklahoma—Northwestern

Enid, Okla., Dec. 18.—The Northwestern Oklahoma District Dental Association has elected the following officers for the coming year: I. E. Cordrey, Blackwell, president; J. A. Brown, Cherokee, vice-president; J. C. Devin, Cherokee, secretary-treasurer. Earl H. Westenhaver, of Kansas City, gave an interesting clinic Tuesday morning. Other dentists, members of the association, conducted clinics.

Classified Advertisements under this heading, $2.00 each for 60 words or less; additional space, 2 cents per word, single insertion; three insertions or more, special rate on application.

WANTED OPERATOR—Registered in Michigan. Expert in crown, bridge and gold inlay work. Man who has had experience in orthodontia. At least thirty years old, one desiring a steady position. Address, C210, care The Dental Summary.

WANTED—Dental Inventions and Discoveries—appliances, instruments and medicines; marketed to best advantage and profit to the dentist owning them. Fees reasonable. Advice gratis. Address, C. J. Drake, 119, 16th Ave. So., Nashville, Tenn.

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Precision Handpiece Reconstruction

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X RAY A complete course of private instruction in DENTAL ROENTGENOLOGY is offered. Special attention to technic. Address

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452-454-456 Rose Building CLEVELAND, OHIO

DEATHS

At Hagerstown, Maryland, January 6, Dr. Edgar A. Firey, aged 48, was fatally injured in an automobile crash.

At New York, January 11, Dr. J. B. Hanaina, aged 24, was murdered by being beaten and chopped with a hatchet by Isaac Isaackowitz, who has confessed the crime, which was inspired by a desire for revenge for action taken by the murdered man leading to conviction of the murderer on a charge of criminal assault upon a female relative, resulting in a seven-year term at Sing Sing.

At Lockhart, Texas, January 2, of pneumonia, Dr. D. A. Combs. He was one of seven brothers, all practicing dentistry in Texas.

At Akerman, Mass., December 22, Dr.

THE RR Schimmel Co.

Special Dental Needles

Special 1⅝ Inch (42 mm.) Iridio-Platinum Needles

Extra heavy walls; outside diameter same as regular I.-P. Needle. Considerably stronger than the regular. No special chuck necessary.

Price, per single Needle, $3.00

Special 2 inch (50 mm.) Steel and I.-P. Needles

This is our regular 25-gauge, but 2 inches long. May be used with all regular Chucks.

Prices, per Vial of Six Needles, steel, . $0.85
per Single Needle, Iridio-Platinum, 4.00

Special 1⅝ Inch (42 mm.) Steel Needles
19-Gauge

Steel needles in this length in both 19 and 22 gauge, for heavy work, dental and surgical; mandibular injection, etc.

The 19-gauge is the size referred to in Dr. Fischer's book on local anesthesia as "No. 1 Needle."

Special Chucks are required, having larger needle-opening, Chuck *B19* for the 19-gauge.

Price, per Vial of Six Needles, 19-gauge, $0.75. Chucks, each, $0.25.

Special Telescoping-Sleeve Chuck "T-S" For Schimmel Needles

A new idea, practicable and desirable in many cases. A Chuck with telescoping sleeve which supports the needle at all times, sliding back into the chuck as needle penetrates the tissue. Takes regular Schimmel Needles. Price, each, $0.50. Extra sleeves, each, $0.10

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CLEVELAND COLUMBUS AKRON FLINT DETROIT GRAND RAPIDS

Walter G. Douglas. He was national amateur billiard champion in 1912.

At Seattle, Wash, December 29, Dr. J. W. Penberthy, aged 70. He formerly practiced at Minneapolis.

At Grand Rapids, Mich., December 15, Dr. Byron A. Nelles, aged 61. He had practiced 30 years.

William A. Johnston, aged 70, director and manager of the Princess Bay, Staten Island, factory of The S. S. White Dental Mfg. Co., died January 14, in the Equitable building, New York City, where he had gone on business. Taken suddenly ill, a physician was summoned, but death came before medical help could be rendered.

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Supports Itself; will not drip or run. ***Always* Inserted Without Pressure**

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TRY IT—use half of it and if it is not the greatest temporary cement you ever used, box it up and send it back for full credit. Put up in white only; may be colored pink with powdered carmine.

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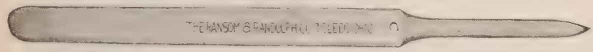

Large package (3 oz. by vol.)	$2.50
Liquid or powder, separate	1.25
Spatula, style C	0.25

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Aren't you glad you don't live in Washington? Retailers there are charging as high as 300% advance over wholesale prices Investigation by the Senate has revealed the astonishing fact that the retailers of foods are realizing more clear margin than the farmers, the transportation companies, the jobbers and the wholesalers—than all who have anything to do with it, combined.

Remembering the scandal that attended the June examinations, when more than ninety students conspired to buy the question papers in advance, the Nebraska State board conducted its November session in such manner as to avoid a repetition. The questions were printed and handed out one page at a time as needed. Some forty-five students took the November examination.

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In use exclusively in thousands of Dental and Surgical offices for the past ten years with very satisfactory results.

Extract from a Letter from Harrisonburg, Va.:

"I hope to have the pleasure of meeting you some day. I can tell you better than I can write, what the *whole* profession *should know*—that you have the only perfect, unfailing and absolutely [the only harmless anesthetic made. Keep up the good work!"

Sincerely yours,

Name on Request

BEWARE! "Cocain is a pronounced protoplasmic poison. All cocain preparations should be shunned, no matter how carefully compounded."—*Fischer*

Per ounce, liquid	**$1.00**
Six ounces	**5.00**
Ampules, per dozen	**1.00**
Tablets, per vial of 50	**1.25**

Write for Pamphlet on Conductive Anesthesia by Prinz

Again Packed in Glass-Stoppered Bottles.

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TOLEDO, O. U. S. A.
CLEVELAND COLUMBUS AKRON FLINT DETROIT GRAND RAPIDS

REGULAR CONTRIBUTIONS

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL March 1920 No. 3

FIXED BRIDGEWORK*

BY EDWARD T. TINKER, D.D.S., MINNEAPOLIS, MINN.

THE STUDY AND APPLICATION of crown and bridge restoration both of the fixed and removable type is one of the most fascinating in our line of endeavor, and I know of no other branch of dental effort that is accomplished with more pleasure to both the patient and operator, than the taking of a badly-mistreated mouth infested with diseased areas and disfigurement and restoring the same to health and an approximation of its original beauty.

To the dental profession this subject is of paramount importance, and, as we are all aware, great damage has been done by its faulty construction and unwise application.

Chiefly among the causes for such disappointing results have been: *First*, faulty, and in many cases, no attempt at diagnosis and prognosis; *second*, failure to remove foci of infection and inattention to treatment and care of the investing tissues and mouth sanitation; *third*, disregard for tooth form; *fourth*, absence of proper embrasures; *fifth*, interproximal spaces; *sixth*, faulty occlusion and articulation.

Before enlarging upon the foregoing, let me say that I believe we may divide the dental profession into three classes: *First*, those who are partisan to the point of exclusion of all other types of reconstruction excepting fixed bridgework; *second*, those who are just as partisan in their adherence to the removable type of work; *third*, those who use both types and endeavor to apply the one which, in their judgment, is most applicable to the particular case presented. I believe that most of the profession in our part of the country belong to the third classification, using fixed bridgework whenever we can apply it with safety, applying the removable type in cases beyond that line.

This paper will deal almost entirely with the former, as a discussion of both types of restoration would cover too large a field to be touched upon in one evening.

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*Illustrated lecture, Nebraska State Dental Society, May 1919; Northern Ohio Dental Society, June, 1919.

Judgment in any given case is most essential and is based upon a thorough diagnosis and prognosis. In arriving at such an understanding a complete X-ray examination should first be made. These radiographs should be studied for foci of infection, the extent of bone destruction in pyorrhea, as well as for determining the thickness and strength of the alveolar process surrounding the teeth to be used as abutments. Upon this one condition will depend largely your prognosis. Edentulous spaces must be examined carefully for broken roots and necrotic sockets remaining from previous extractions where proper curettement was not resorted to, infection still remaining. Radiographs also are valuable in disclosing hidden decay, especially under old fillings and crowns, at and beneath the gingiva. In addition to this examination, study models should be made and mounted upon an anatomical articulator. These models will reveal the forces of occlusion and articulation; so a decision can be made as to whether the bite should be opened, whether certain teeth will require dressing down on the cusps, or a combination of both to give a balanced articulation.

Malocclusion must be corrected to the point of removing sound teeth, should such teeth be so out of line or elongated from disuse as to make a correct occlusion and articulation impossible. In many of those cases an orthodontist is of valuable assistance.

In all of our procedure we must never lose sight of the fact that we are dealing with the mouth as a unit, each tooth being but a part of such and having no value when it obstructs the function of the whole.

The foregoing principles are fundamental and necessary to the successful use and longevity of fixed restorations and I may say apply equally to the removable type. Couple the information so gained with clinical evidence and we have a knowledge of the case upon which to proceed. In fact, you have a picture of the finished product in your mind, without which no one can be successful to the fullest extent.

Not only is it necessary to eradicate all foci of infection, but all deposits must be removed, faulty contacts and overhanging margins corrected, and, in fact, the elimination of everything that may make trouble for the investing tissue is imperative.

The gum tissue shall, by proper prophylaxis and massaging, be placed in a healthy condition, and the patient be instructed how to keep it so. Furthermore, the restoration we place, whether it be fixed or removable, must be so constructed that it may be kept sanitary by the wearer.

By faulty articulation we mean an articulation that is not well balanced, where in the lateral and forward thrusts of the mandible certain teeth bear all the force, and should such teeth be a part of the bridge, lameness is the result, causing an inflammatory condition of the peridental membrane, gingivitis and subsequent loss of such teeth. This point is one to be determined largely when making your diagnosis upon study models.

Necessary to a proper occlusion and articulation is correct tooth form, and herein lies one of our weakest points. The more we study the human tooth the more we must realize how far our best efforts fall short of reproducing it. Occlusal planes especially must be properly reproduced in order that our bridges functionate as they should. The distance from the tip of the buccal to the tip of the lingual cusp is, in all molars and bicuspids unless they be worn down by abrasion, practically the same as the longest diameter of the tooth bucco-lingually at the cemento-enamel junction. How often do we see this rule of nature totally disregarded, not only in crowns and bridges but in operative dentistry as well. The result is that we have unnatural forces brought into play, not only by pounding on occlusal planes, but by striking on the contour of the tooth buccally to the high point of the cusps on the lower teeth, and lingually to the high point of the cusps on the upper teeth, giving the patient a sense of lameness, and in many instances producing symptoms akin to alveolar abscess, resulting ofttimes, if not corrected, in premature loss.

Many cases of bridgework are constructed without regard for the embrasures. In fact we often see soldered contacts as broad bucco-lingually as the abutments and dummies are themselves. Most of these cases are a straight line mesio-distally on the lingual surface from abutment to abutment. When we realize what strain we are placing on these abutments by tying them together and how we double up the stress under which they must labor, we will recognize the necessity of giving them every advantage possible. That advantage is made possible largely by utilizing nature's embrasures. They form waste gates through which food passes during mastication, immediately relieving the teeth of their stress. In bridge construction these embrasures should be exaggerated, and the transverse fissures always should divide the marginal ridge lingually to the contact point and be carried well to the gingiva. The food escaping through the embrasures massages the gum underlying, and aids materially in maintaining health of that tissue. For illustration, in operative dentistry where crowns and inlays of otherwise correct construction but having unbroken marginal ridges are used, diseased septal tissue is the result, and is corrected by cutting the transverse fissure through these unbroken ridges allowing excursion of food for stimulation of underlying tissues. Application of this one principle will go a long way toward attaining a result.

Very little solder should be used in uniting dummies with the abutments. The soldered joint should be small and circular in form, the contact point being its center, and should occupy only the occlusal third of the interproximal space.

Dummies should be tapered to a gingival end in excess of the natural teeth they replace, and are more sanitary if the tip end be made of highly-glazed porcelain, which should rest preferably on the crest of the ridge, or slightly to the buccal or labial as the case may be. Enlarged interproximal spaces are obtained through which the bristles of a tooth brush and tape readily are passed, and this coupled with the fact that the gum tissue takes more kindly to highly-glazed porcelain than metal, makes for a healthy condition.

To attain the foregoing results, I wish to mention the necessity of carefully-taken impressions as being of vital importance in the making of bridge dummies. In all bridge construction, especially where the cuspid and incisal regions are involved, a complete impression and models must be made of both the upper and lower jaw, for the reason that in making an anterior case, a good, hard model of either cement, amalgam or some equally dense material, of the molar region above and below, is just as essential as of the opposing teeth, for the reason that to obtain a balanced articulation the molars on the opposite side are going to determine the length of your construction and cusp inclination.

The methods of operative procedure also have a bearing on the success of the operation of tooth preparation. Conductive anesthesia is used wherever the work cannot be accomplished without too much discomfort to the patient, but whether operating under anesthesia or otherwise, care must be used that the tooth in question does not become over-heated, and more especially must this be guarded against when it is under an anesthetic, for the reason that the sense of pain is not present to give its warning.

The proper lubrication is best attained by a stream of water of 110 degrees Fahrenheit, thrown upon the stone and tooth while operating, thus keeping the entire field at the same temperature.

During certain phases of the operation, compressed air is preferable, for the reason that the vision of the field is clearer than with the stream of water, but generally speaking, the major part of the time I prefer the warm water to the air.

During the interval between the preparation and the setting of the restoration, the teeth in question always should be protected. This protection is best accomplished by adapting a seamless copper or aluminum band to the tooth, and filling the same with pink base-plate gutta percha.

The pain incident to cementation is frequently of a very severe nature, ofttimes requiring a number of days before returning to normal. Here is where I have found novocain anesthesia and in many cases nitrous oxid analgesia of very great value, holding the teeth without sensation during the setting of the cement, and by the time sensation has returned, the free acid which is the active irritant has been taken up, thereby obviating to a great degree any subsequent hyperæmic condition of the pulp.

Another and equally important advantage gained by so handling these sensitive cases during cementation under anesthesia, is that more nearly absolute dryness can be maintained and the tooth surfaces can receive more aseptic treatment and varnish applications than otherwise would be possible.

Fixed bridges when properly constructed, and attention given to detail and applied in small spans to abutments supported by strong alveolar process, and of sufficient length of crown to afford frictional resistance necessary to stand the torsion under which they labor, we know are good for many years with freedom from trouble, and with health and comfort to the wearer, and I am far from convinced that under conditions stated, have we any other type that has proven its superior, allowing us to retain the vital pulp which we must admit is the most aseptic root-canal filling.

Until such time when we can assure the patient of our ability to remove the dental pulp and treat and fill the root canal without the possibility of its becoming a foci of infection, we have no right to do so simply to make possible the application of a mechanical principle.

The technical section of this paper I will illustrate with lantern slides and will deal entirely with bridge attachments for vital teeth, and porcelain root-tipped dummy construction.

The idea originates from a paper given by the late Dr. Wassall, of Chicago, in Washington about fourteen or fifteen years ago on the subject, "Gold Shoulder Crowns." These crowns were placed upon devitalized teeth using a burnished matrix, and building the contour by the inlay method of that day. The advantages of this crown over the banded type are mainly continuity of crown with root surface, leaving no hidden recesses to lodge debris, setting up an irritation to the soft tissues, in fact prophylaxis can be carried on equally well after their insertion as before.

The enamel does not have to be scaled in its entirety from beneath the free margin, thus obviating the danger of injury to the peridental membrane, and were it possible of accomplishment without this danger, the replacing of the crown in the same relation to the gingiva is a difficult procedure, to say nothing of the deleterious effect metal has when placed so far beneath the soft tissue.

When Doctor Taggert gave us his invention, I found it was feasible to apply the idea and its modifications indiscriminately to vital teeth.

Inlay attachments have their place in this field, but I believe they are well enough understood to make their elaboration unnecessary, concentrating the discussion on the gold jacket crown, both full and three-quarter.

We can place porcelain in close proximity to the pulp with comparative safety, on account of the non-conductivity of the material, where, were we to use gold in the same manner, negative results surely would follow. A wide shoulder on a porcelain jacket preparation, I believe, is to be desired so that the crown may have sufficient body for strength and reproduction of shades. With the gold jacket preparation both full and partial, neither of the requisites mentioned have to be considered. The question of bulk for strength is well taken care of by the removal of the contour sufficient to allow the drawing of the wax crown and the placing of the gold cast duplicate, from and to the line where you have determined the gingival margin shall be, providing a casting gold of sufficient rigidity is used. Simple restoring of the contour will give all the strength needed, the shoulder being merely a definite line or slight indentation around the tooth at that point.

Its main reason for being there is to enable the operator to obtain a flush joint necessary to the finished product and carrying on of future prophylaxis. Should I dwell upon this point during my lecture and clinic, it will be for the reason that conservation of tooth structure is all important, and as a result of my experience in teaching this work, I know it is the reason for most of our failures.

We have been criticised by dentists not familiar with our technic, in the use of the full crown on a vital tooth, their argument being that it cannot be applied to one with a bell-shaped crown without consequent dissolution of the pulp. If we were guilty of the accusation we would fully agree with them, but our answer is that a bell-shaped tooth never calls for a full preparation, it being of sufficient length gingivo-occlusally to give resistance necessary without carrying margins buccally and lingually toward the gingiva farther than the height of the contour, never endangering the horns of the pulp. It is least used of any of the attachments and is applied to that type of tooth so short from the gingiva to the occlusal that we must utilize every part of the frictional wall it affords, to give resistance to the torsion under which it is placed as a bridge abutment.

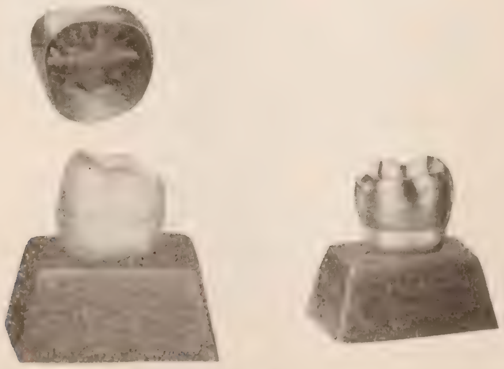

Fig. 1

Figure 1: —Its application includes a small percentage of third molars second molars and in some cases, lower first bicuspids, *Figure 2A*, for the reason that in many of these teeth the lingual cusp is so short and ill-

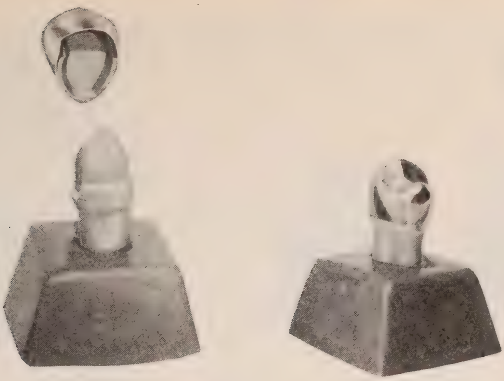

Fig. 2

defined as to afford practically no resistance, making it necessary to utilize the buccal surface either entirely or in part.

Co-essential with the careful cutting of the sides, is the dressing down of the occlusal surface. This part of the operation should be accomplished with small carborundum stones of cylinder and inverted cone shapes, and when completed should be merely a reduction in height of the cusps, occlusal planes and sulci, from one millimeter in the sulci to one and one-half to two millimeters on the cusps, dependent upon the nature of the articulation. (*Fig. 1.*) This allows us to retain the maximum amount of tooth structure over the horns of the pulp, as well as adding from one-third to one-half of the frictional wall from the occlusal to the gingiva, over the old method of dressing down the occlusal surface to a flat surface with a large wheel stone.

By following this technic, you reduce the thickness of the casting to only the amount needed in its construction to withstand the wear of occlusion, and permit of reproduction of tooth form, and greatly minimize the danger to the pulp from thermal shock. The preparation of the sides of the tooth is accomplished with vulco-carbon disc and conical-shaped carborundums, simply dressing away sufficient enamel and dentin, and in many cases only enamel, until the crown will draw from the line where you previously have determined the gingival margin shall be. This finishing line is then definitely outlined, preferably with the smallest cylindrical-shaped carborundum.

In determining the position of the gingival margin, we are guided by Dr. Black's rules of cavity preparation. When the gum tissue and tooth crown are in their normal relation, the margins in the interproximal spaces must be carried just beneath the free margin. On the buccal and lingual, the soundness of the enamel surface and your judgment will decide where it shall be placed, preferably keeping it away from the gingiva as far as possible. Under any condition, however, when you must carry the crown to the gingiva, you must go slightly beneath it. Where the gums have receded, apply the same treatment you would in any

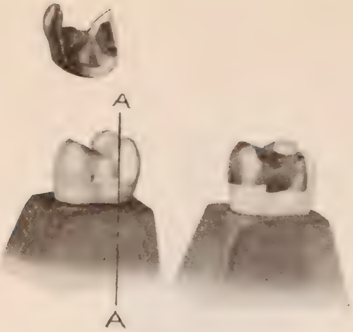

Fig. 3

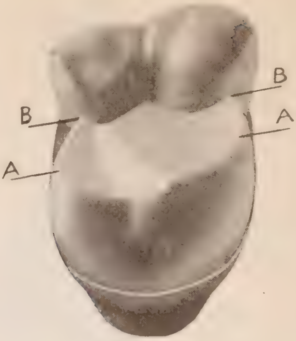

Fig. 4

operative procedure, wherever possible, keeping all margins occusally to the cemento-enamel junction.

Figure 3 represents what we term a three-quarter crown for an upper molar, the application of which is more universal to these teeth than any other attachment excepting possibly the MOD inlay. Instrumentation in the main, differs but little from that for the full crown, with the exception that the buccal surface is not included, the crown terminating buccally with a typical MOD inlay margin. There are several rules which I will mention here that apply to all molar and bicuspid three-quarter preparations. *First*, that just as little tooth surface should be removed from the mesio- and disto-lingual angles necessary to allow the thinnest gingival margin possible at these points, for the reason that the longest distance mesio-distally should be from A to A and the shortest from B to B, being the occlusal openings of the grooves (*Fig. 4*), these being the features which guard against lingual displacement and gives the necessary grip upon the tooth. Extension for prevention must be practiced to the extreme wherever an inlay or three-quarter crown is used as a bridge abutment. (*Fig. 3*). The mesio- and disto-buccal angles must be extended far enough out to make the margins visible in their entirety for their full length after the dummies are

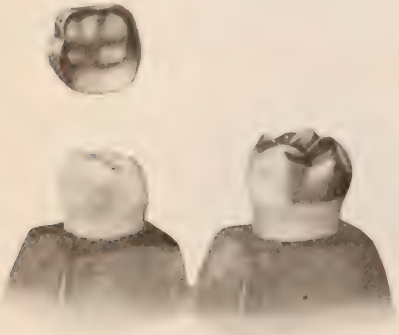

Fig. 5

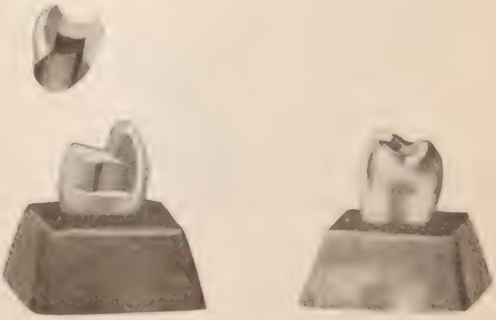

Fig. 6

assembled. The failure to do this will result in recurrent decay at these points. The two parallel grooves illustrated from A to A should be placed just as far buccally as the case will permit and parallel to the long axis of the tooth (*Fig. 5*). The farther you place them buccally the more tooth structure you will envelope with the crown. Grooves are never made across the occlusal, this surface merely taking the form of a step terminating in a slight acute angle with the buccal wall of the preparation. The lower molar is the only tooth in the mouth where the buccal is the third surface used in connection with the mesial and distal to make a three-quarter preparation, on all others using the lingual. The reason for the difference being the natural inclination of this tooth lingually, making necessary the cutting of this surface, to receive this crown, but very little.

Decay along the buccal surfaces at the gingiva, in patients who have reached the point in life where these restorations are necessary, is prevalent, and the opposite we find true on the lingual.

Figure 5 represents the type of partial crown applied to these teeth having comparatively long crowns in which the lingual cusps are weakened by decay calling for their protection. This preparation is carried far enough over them toward the gingiva on the lingual to permit of sufficient hold. This principle applies on any other tooth where a like condition exists.

Figure 6 represents cavity preparation and finished three-quarter crown for bicuspid applied to either the upper or lower, the method of construction of which is so near in detail that explained in molar construction, that anything further need not be said.

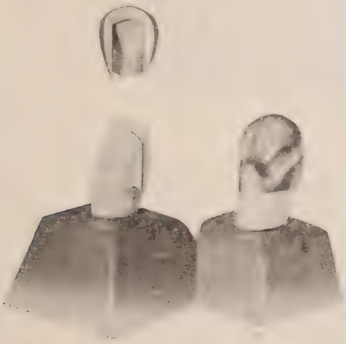

Fig. 7

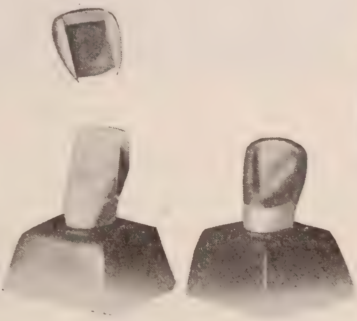

Fig. 8

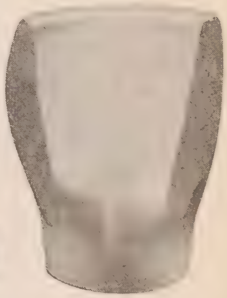

Fig. 9

Three-quarter crowns find the greatest use on the six anterior teeth. *Figure 7* represents the cuspid, the details of which are the same as the central and will be covered by the technic given later for that tooth. *Figure 8* is a central incisor showing the preparation and the finished crown, which I will go into with considerable detail. *Figure 9* represents the two initial cuts which are accomplished with a vulco-carbon disc, removing simply the contact points of the mesio-and disto-lingual angles, reaching to the gingiva at these two points. Very necessary is the manner in which the stone is held. The correct position is shown in A, (*Fig 10*), slightly convergent with the long axis B-B of the tooth toward the incisal. The incorrect method is illustrated by same cut at C, and this is a very common fault, many times resulting disastrously, for the reason that if too much tooth structure is carelessly removed from the gingival point, the balance of the tooth above it must be cut away in order to allow the crown to draw. Not only does this weaken the preparation but causes many hypersensitive teeth. To avoid injury to the contact points of the teeth contacting with the one under preparation, separation should be gained and a metal matrix placed over them previous to the use of the vu'co-carbo disc.

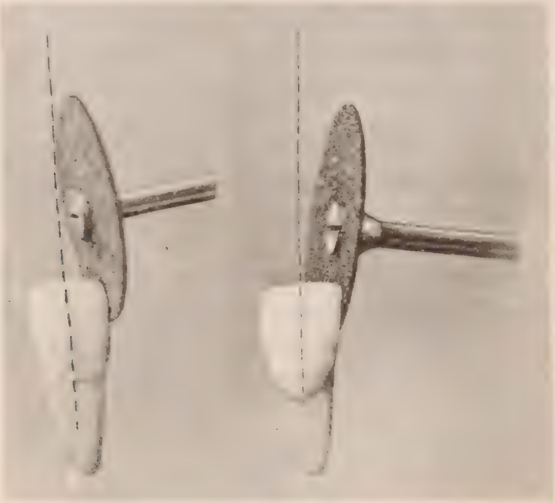

Fig. 10

Second step: *Figure 11* illustrates the removal of a sufficient amount of the lingual plate of enamel to permit of the restoration and protection of the incisal angle. The incisal end is protected with a long bevel in exactly the same way and for the same reason that we protect a porcelain facing when used as a dummy. *Figure 12* illustrates third step or the correct method of preparing the incisal step, which part of the preparation is accomplished by the use of small cylinder carborundums, completed with a large inverted cone bur No. 40 or 41. The bur being shaped as it is, produces an acute angle at the junction of the incisal, and with the labial plate adding greatly to the resistance against lingual displacement.

Figure 13 gives us a definite idea of the position a groove should occupy in an anterior three-quarter preparation, the correct placing of which is of vital importance. This groove always should be started between the lingual and labial plates of enamel at the point made by the acute angle of the incisal step, running parallel with the incisal third of the labial plate of enamel, and terminating in the extreme mesio- and disto-labial angles, as illustrated in the *Fig. 14* by letters A-A. You will note that in the instruction for placing the groove in the bicuspids and molars, its position was parallel to the long axis of the tooth, but were we to use the long axis of an anterior tooth as a guide, we would be utilizing the shortest possible distance from gingiva to incisal that the crown of that tooth affords for the reason that, on account of the dip in the cemento-enamel junction incisally at this point, and when we take into consideration that the strength of our preparation lies only in that part of the tooth crown engaged, extending from the bottom of one groove around the lingual surface to the bottom of the groove on the other side, we will see that we have taken in only the weakest part of the tooth and have lost the advantage gained by utilizing the distances between the long axis and the correct groove position.

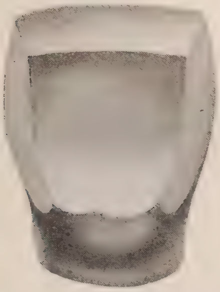

Fig. 11

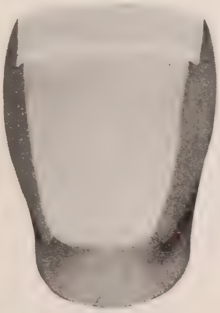

Fig. 12

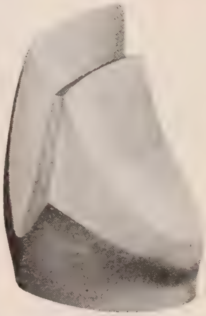

Fig. 13

Aside from this, the groove paralleling the incisal third of the labial plate and terminating in the extreme gingival labial angles, will carry those margins into practically immune territory, and will automatically parallel these abutments with the posterior abutments, for the reason that in the normal set of teeth, the centrals tip slightly forward at the incisal, the laterals and cuspids not quite so much, and the bicuspids and molars practically straight.

Figure 15 is shown for the purpose of emphasizing that the grooves must be parallel or as near so as man can make them with the instruments at hand. They are made by using a tapered cross-cut inlay bur, starting with the smallest size and using larger ones as the case progresses until they are shaped properly: They must be wider at the incisal labio-lingually than at the gingival end to allow a slight leeway in placing the crown. The two parallel dotted lines designated by letter A on *Fig. 15* are to illustrate the necessity of correct preparation. The lines designated by the letter B illustrate the incorrect preparation which very often is seen, and that is the cutting of the grooves to the position which they outline. If these grooves were placed convergent to each other so that they would meet at any common point beyond the incisal, the closer that point is brought to the tooth, the more you will have to depend upon cement for retention. A properly-constructed three-quarter crown when started to place should slide in frictional resistance from the time that the gingival ends enter the incisal openings until the crown is seated in position, cement being merely the material used to hermetically seal the joint.

The rigidity of any of these attachments depends first on the bulk of the material which we have from a point designated by A-A, (*Fig. 15*), passing upward to the angle across incisal to opposite angle on to a point designated as A-A. The depth of the incisal step regulates this bulk and the distance measured from D to D should be equal to the distance included from C to C. The shape of the floor of the incisal always should be the same as the incisal end of the tooth upon which it is made.

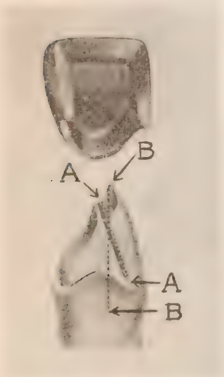

Fig. 14

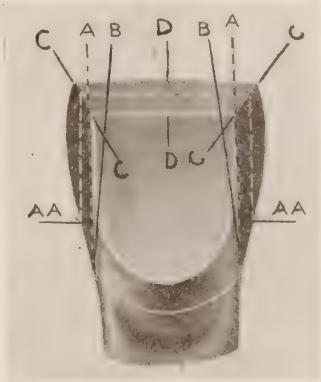

Fig. 15

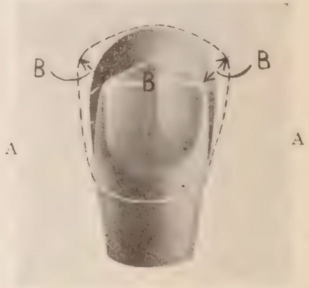

Fig. 16

In the central incisor it is practically a straight line, in the cuspid as per illustration on *Fig. 16*, it will take more the shape of a V dependent upon the sharpness of the cusp. A common error in preparation is to place the floor of the step as outlined from A to A. You will notice that if the step is placed deep enough to give the breadth at the incisal angles, A-B, and prepared in the form of a straight line from A to A, how dangerously near we would encroach upon the pulp, and there is no good reason why this step should be any broader gingivo-incisally at any other point than at the angles A-B.

Figure 17 illustrates the central incisor showing pin retention. We have a certain number of incisors both centrals and laterals where the lingual surface is concave in entire length from the incisal to the gingival, giving no opportunity for any frictional wall around the cingulum. In these cases I use a threaded 21-gauge iridio-platinum wire sunk in the lingual pit. This preparation gives us practically three dowels, the two grooves in apposition to each other, and the pin for the third making a very strong attachment. In some cases the lower incisors, (*Fig. 18*), are called upon to act as abutments, the only difference in this preparation from an upper being that the lingual third of the enamel plate is left intact, only that much being removed as is necessary to produce a shoulder and incisal bevel.

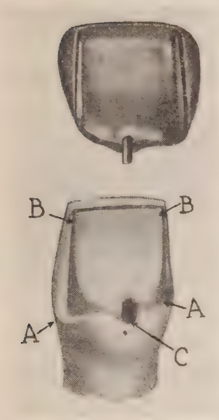

Fig. 17

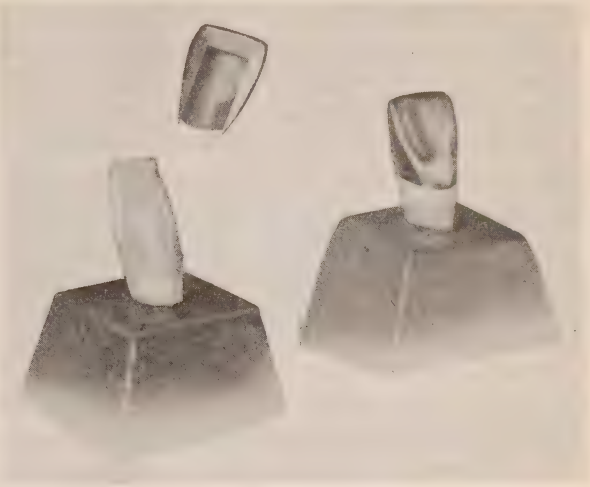

Fig. 18

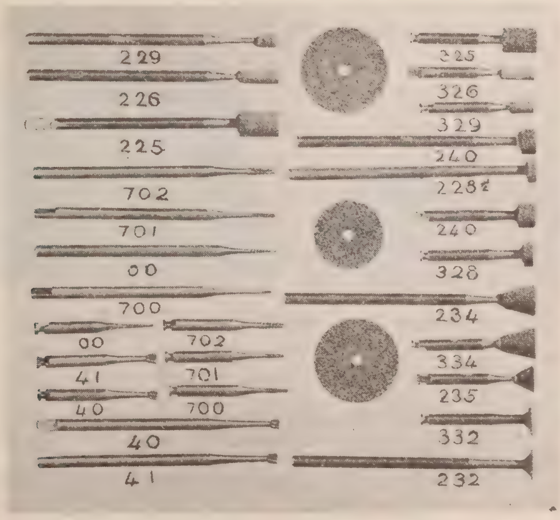

Fig. 19

This procedure is necessary for the reason that were we to remove the lingual plate entirely, we would so narrow up the approximal surfaces labio-lingually that we would have very little frictional wall remaining. Being on the lower jaw, the occlusion does not have to be taken into consideration on this surface, the disadvantage being that the finished crown is necessarily slightly thicker on the lingual than the tooth on which it is placed, but that is of small moment.

The instruments necessary for this work we find in every man's cabinet and the only ones I will illustrate will be the stones and burs which speak for themselves. (*Fig. 19*).

There has been a great deal said both for and against the direct and indirect methods of taking a wax impression. I believe the selection of a method and the success attained is largely a matter of personal equation. Personally I use the direct method to the practical exclusion of the other, believing that the original tooth preparation makes a finer model than one made from an impression of it.

I use the indirect method in full crowns because I have not been able to cast complete rings without shrinkage, and in cases where the decay has passed far beneath the gingiva, under these conditions I value the indirect method, mainly because of the fact that by use of the technic of Dr. Costen, I can swage the casting over the amalgam die, overcoming the shrinkage that exists in the full crown, before placing in the mouth.

In practically all other castings, three-quarter crowns, inlays, etc., the shrinkage of gold when proper attention is given to the details of the casting technic, is of such small moment as to be negligible, the casting so made going to place with the exertion of very little applied force.

We cannot construct dummies by the old method of setting our facings high on the labial side of the ridge, producing a shelf on the lingual surface with no regard for interproximal spaces, tooth form, contact points and embrasures and proper occlusion, and be successful.

We all admit that porcelain produces the best occlusal surface from a masticating standpoint, but we also must grant that porcelain, in contact with the gingival tissues, comes nearer to producing a condition of perfect health than any material outside of the natural tooth itself.

Consequently, any dummies which I shall show in the accompanying illustrations, will have entire porcelain contact with the gum, and gold occlusal surfaces, as we believe that the lesser of the two evils caused by the gold should better be borne by reduced masticating surfaces than by unhealthy gingival tissues.

I shall take up first, the replacement of teeth where extractions have been made previously, and the gum tissue is in a healed state. *Figure 20* is largely self explanatory. Select facing "A," contour and length of the crown of the tooth which was extracted. In the average case this will be approximately two-thirds of the length of the space to be filled by the dummy. Bevel the gingival third of the labial surface in a line bringing the point of the porcelain tip "B" to approximately the top of the ridge or slightly labial to it. Grind facing "C" on both mesial and distal from about the point paralleling the pins, so that a slightly convex line drawn from that point of the apex will give us the proper interproximal space "D." Take porcelain with a fusing point of 2,300 degrees, build it to an excess on the facing, and bake to a high biscuit. Grind to fit the model, place back in the furnace and carry to an overbake, remembering that this porcelain tip is merely to produce a sanitary condition, and that it adds nothing whatsoever in the way of strength to that bridge. Consequently, porcelain baked to an impervious surface for this work would be ruined were it baked to the same degree for an inlay or crown, and if at any time before completion and setting of bridge, this root surface becomes roughened by grinding, it must be reglazed, as it cannot be polished by any method high enough to prevent it absorbing the fluids of the mouth, and becoming just as much an irritant to gingival tissues as an etched enamel surface on a natural tooth. "E," "F," "G," "H," represent the gold occlusal attachment completing the dummy.

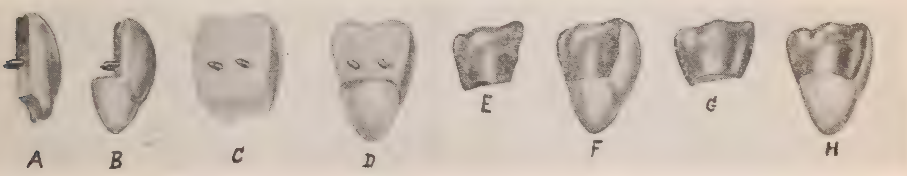

Fig. 20

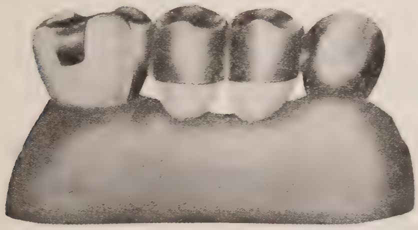

Fig. 21

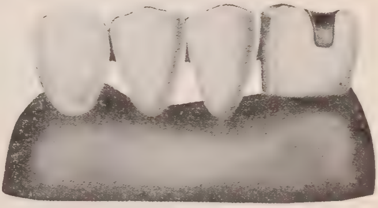

Fig. 22

Figure 21 represents the proportion of our dummy from occlusal to gingiva which should be occupied by the gold and porcelain.

Figure 22 gives us approximately the proper shape of a dummy, its contour, point of resting upon the gum and interproximal spaces. Under normal conditions, the soldering joint should include the occlusal third and interproximal space occupying the middle and gingival third. Every surface of these dummies is convex excepting the extreme occlusal point of interproximal space. They should be so constructed that with the aid of the tooth brush and silk tape the patient is enabled to cleanse every surface. No full denture, removable bridge or fixed structure will be any more wholesome and sanitary than the wearer is pleased to keep it, and it is up to us as dentists to produce restorations which are possible of proper cleansing.

When a bridge is to be constructed involving any of the bicuspid or six anterior teeth, and extractions have not been made in selected cases, my method of replacement is to insert porcelain roots one-fourth the length of the root of the natural tooth, having the bridge entirely constructed before such roots are extracted. Place the bridge in position at the same sitting that the teeth are removed, being sure that the socket is thoroughly curetted at the time of extraction.

One essential feature of this work is that the porcelain root must take the shape and entirely close the orifice of the root socket, tapering from beyond this point to the root tip. These root tips are advisable, and are attended with excellent results, when extensive necrosis is not present. Very little absorption takes place. The gum tissue hugs the porcelain root very close and remains in an exceedingly healthy state; in fact, many cases of over three years' service can hardly be told from the abutment next to it, mainly because of the way in which they retain facial contour.

I will mention a few details of construction. Prepare abutting teeth and make your abutments. Fit them in the mouth and take a full impression in modelling compound by the core method. Remove abutments and place them in position in the impression and run. Mount full case on an anatomical articulator. Study the radiograph of roots to be replaced. Approximately outline on the labial surface on the model with a lead pencil, the direction and length of such roots. With a sharp lance cut away the crowns, definitely outline the gingival margin and excavate sockets on the model to approximately one-fourth the length of the root. Proceed to grind facing in position. Bake on porcelain root and carry to high biscuit, grind to fit socket and glaze.

The remaining part of the construction does not differ from any other bridge excepting this, that on the lingual surface of these dummies, they should conform to the anatomy of the teeth they are to replace. When the roots are extracted, the bridge should be tried in position first without the porcelain roots to be certain no warpage has taken place during its assembling. Remove and place facings in their respective positions without cement, and replace in the mouth. Should the root bind at any point it should be dressed with a stone, after which reglaze and cement to the bridge. Set the bridge with eugenol and oxid of zinc temporarily, it being my practice never to cement one until from one to three weeks have elapsed after extraction, for the reason that we may encounter secondary infection, and were our bridge cemented, a great deal of trouble would ensue.

When you have determined that the tissues are in a healthful state, remove bridge and thoroughly sterilize both the sockets with iodin, and the bridge with a 50 per cent. alcohol solution, and cement, being careful that nothing comes in contact with the porcelain roots which might possibly carry infection into the sockets.

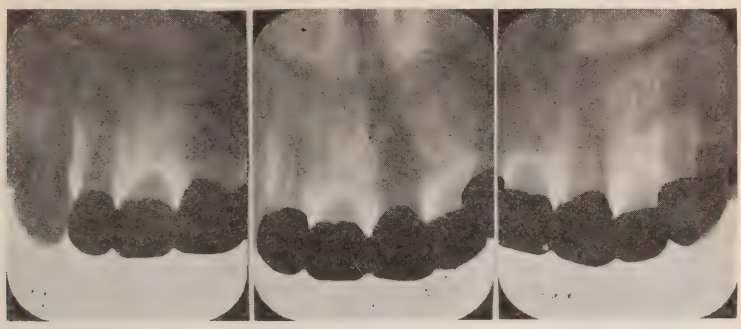

Fig. 23

Figures 23, 24 and 25 are made from X-rays to illustrate foregoing remarks.

Where we have one tooth to replace and the teeth on either side not affected with pyorrhea, it is a good practice to use simple inlays or some other form of inlay attachment, as in illustration, *Figure 26A*, soldering the dummy to the distal one only, and making a socket on the distal contact point of the anterior inlay. The diameter of this socket is slightly larger at the orifice than at the bottom, rendering a slight movement of each abutment possible without bringing any stress on either one; in other words, breaking the stress between the abutments, a feature you all must realize as being invaluable up to a certain point in any case where two or more teeth are tied together. The construction of this work is very simple and the only feature necessary to enlarge upon is taking our impression and making the model. The impression must be taken

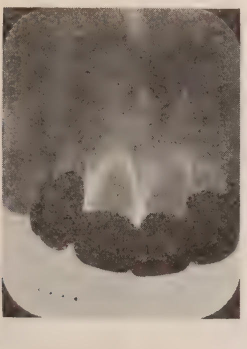

Fig. 24

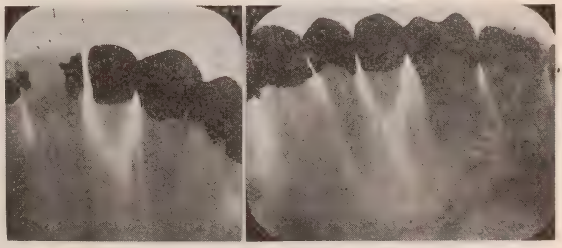

Fig. 25

with modelling compound, the reason for which will be seen later. Seat your impression in the mouth and while the modelling compound is in a molding state, remove about one-third the distance away from the teeth, repeating this at least twice, in order that all undercuts may be broken. Now hold the impression firmly in position until entirely hard. Remove abutments and place in their positions in the impression. The inlay which carries the socket must have a very thin film of wax melted over its cavo surface. Mix a quantity of technic cement and pour the impression of the tooth carrying this inlay, including one or two anteriorly to it. Place a tack before it hardens. The rest of the impression pour with any good soldering investment compound. When the model is separated, apply a hot spatula to the inlay in the cement tooth which will melt the wax and allow you to remove the inlay from the cavity. This must be done for the reason that when the dummy is carved in wax including the lug which rests in the socket, in order to remove for investment and casting, the mesial inlay will have to come also, and then be separated from the wax dummy.

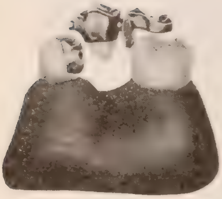

Fig. 26a

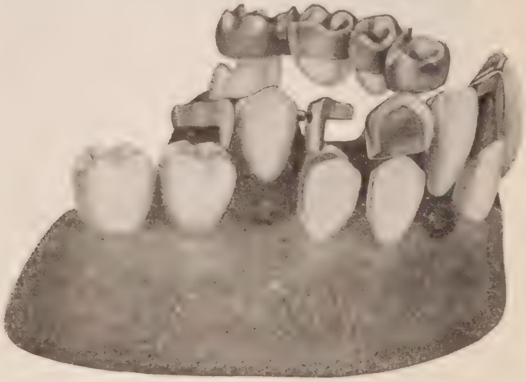

Fig. 26b

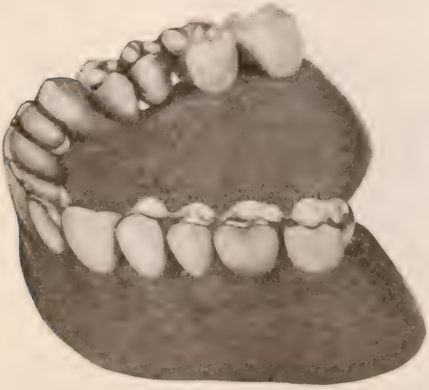

Fig. 27

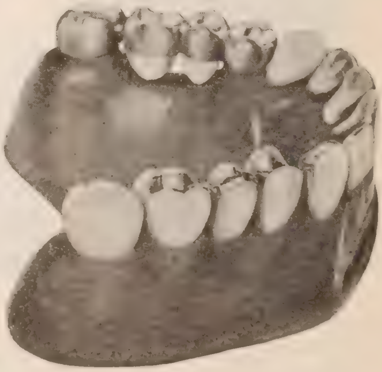

Fig. 28

After this is cast, it is fitted to this inlay, replaced on the model, waxed to distal inlay and soldered. This idea can be used in many diversified ways in small bridge restorations. It has its advantage over the old type of the rest lug bridge from the fact that there is no lost motion giving undue stress on the abutment which carries the dummy. It can be controlled for each individual case by the taper given the lug. The more taper the more motion, the reverse being true.

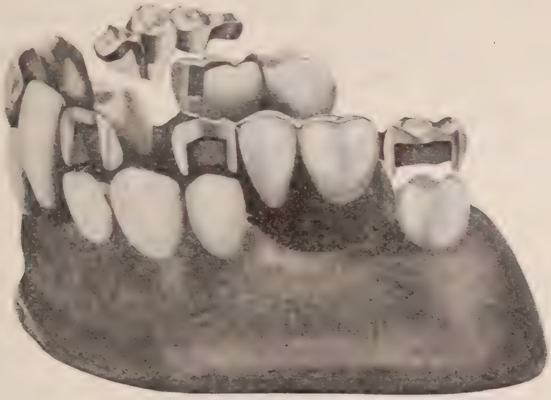

Fig. 29

Figures 26b, 27, 28, 29, 30, represent different views of a completed upper case, illustrating especially the lingual contour of the dummies and proportions of gold and porcelain used in their construction, occlusal reproductions of tooth form, proper embrasures and interproximal spaces, extension of the labial and buccal margins for prevention of subsequent decay, the paralleling of abutments and porcelain root implantation.

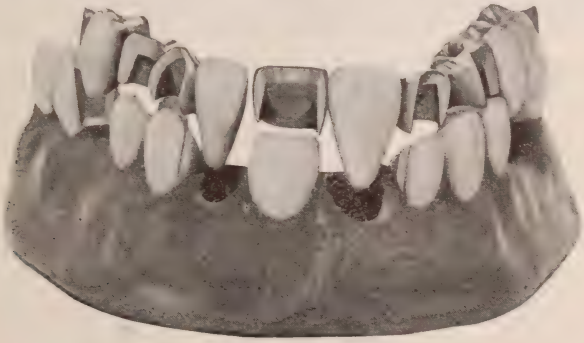

Fig. 30

Donaldson Building.

CHRONOLOGICAL NOTES ON DEVELOPMENT OF DENTISTRY*

BY J. P. HENAHAN, D.D.S., CLEVELAND, OHIO

TOOTH EXTRACTION has been practiced in one way or another, as a method for relieving pain, by every people whose medical practices have been recorded in history.

In ancient times very few dental operations of any other nature were resorted to and no distinction existed between the dentist and physician.

THE ANCIENT PRACTITIONER

In all countries whose medical history has been written, the physician embraced within his line of duty the practice of such known procedure for the relief of pain and the cure of all morbid conditions recognized as arising from carious and infected teeth. Indeed, until comparatively recent times, the only writings referring to dentistry which can be found, are those contained in works by medical writers.

OLDEST REFERENCE

The oldest noted reference dealing with dental infection and extraction is that of Hippocrates, which tells of the Athenian boy "who suffered pain in a lower tooth on the left and an upper on the right, and that when the pain stopped there was suppuration of the ear."

The literature of Egypt, Greece, Rome and other countries, together with engravings and inscriptions on stone and certain designs on pieces of pottery, believed to commemorate special events of dental importance, are the foundations upon which are based our present knowledge of dental operations as practiced in those times.

ANCIENT METHODS

Judging from the story of dentistry of those times, the removal of a tooth was achieved only by great effort on the part of the operator, with much pain and suffering on the part of the patient, and usually prolonged over a great period of time. In some cases, we are told, certain applications were employed which slowly caused a sloughing of the tissues supporting the diseased or paining tooth. In other instances, we are told that through the aid of an improvised chisel and a stone for a hammer, the tooth was evulsed by a blow.

Reading between the lines, we recognize in the ancient operator and patient, the same state of mind that is seen today. With the progress of civilization we see the effort to perfect methods for simplifying this operation, and we are told by Celius Aurelianus of leaden dental instruments in the form of pinchers (Plumbeun Odontagagon) which were designed and deposited in the Temple of Apollo, at Delphi.

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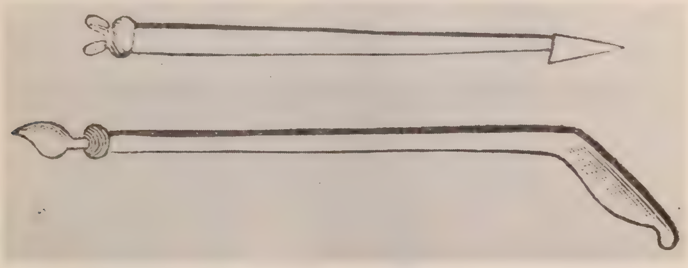
*This article is an introduction to a series of papers on Extraction of Teeth as viewed from the position of the Twentieth Century Dentist.

These forceps being made of lead, much controversy has resulted over the question of whether they were simply a pattern or the instrument with which the operation was performed. With the lapse of time, other instruments of various design, such as forceps, the pelican, the key and later the Lecluse elevator, made their appearance.

The general effect of a perusal of the story of dentistry reveals the fact that in ancient times attention was given to dentistry only to a very small extent, notwithstanding the fact that some of the ancient writers wrote of their activities and observations. During the middle ages considerably more was written and the subject received increasing attention as the centuries rolled by. In spite of the writings upon the subject, the fact remains that dentistry as a special department of surgery was permitted to degenerate to such an extent that it was considered only as a fit occupation for charlatans and fakirs.



Figs. 1 and 2—Elevators for extraction of roots which were impossible of removal by use of root forceps (Abulcasis) 1050–1122. Copied from Guerini.

In the middle ages the Arabian doctors contemptuously refused to extract teeth because, as their actions indicated, they considered it as fit only for barbers. In that country at that time one form of public punishment was meeted out in the form of compulsory tooth extraction, and in such cases the operation was performed by the executors of public justice. In effect, the Arabian doctors considered the extraction of teeth as akin to the occupation of the hangman.

From the tenth (10th) to the eighteenth (18th) century many contributions were given to dental literature by the writers of Arabia, Italy, Spain, Germany, Belgium, France and England.

Beginning with Abulcasis, a Spaniard, who lived from 1050 to 1122, we have the first prolific writer. He wrote a book, illustrated, showing many designs of instruments. He was the first to call attention to the elevator as an instrument for the removal of roots. There were many designs of this instrument. (*Figs. 1 and 2*).

In the thirteenth (13th) century, Giovanni, of Arcoli, told for the first time of gold for filling teeth. He also was the first to tell of the pelican, and presented drawings showing three dental instruments. (*Figs. 3, 4, 5*). The pelican was by him called, "pulicanum." For several centuries after, we see these instruments modified in many different ways, but retaining practically all of the original characteristics. (*Figs. 6, 7, 8*).

The next great change was the key of Gorengeot. Gorengeot was a French surgeon who lived from 1688 to 1759. He wrote about the key and for a long time it was supposed that he was the inventor of this instrument, but later we are told by Lecluse that the key existed long before the time of Gorengeot and was known as the English Key. In England this same instrument was known as the German Key; so that in regard to this instrument and its invention we are absolutely at sea. No one seems to be able to point to who invented it or where. (*Fig. 9*).

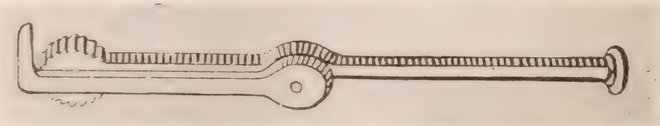


Fig. 3—The pelican as represented in Giovanni d'Arcoli's work. Forceps pro extrahendis dentibus publicanum dicta.

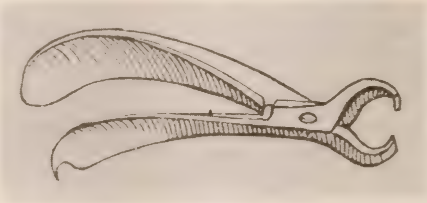


Fig. 4—Dental forceps (Giovanni d'Arcoli). Forcipum pro extrahendis dentibus forma.

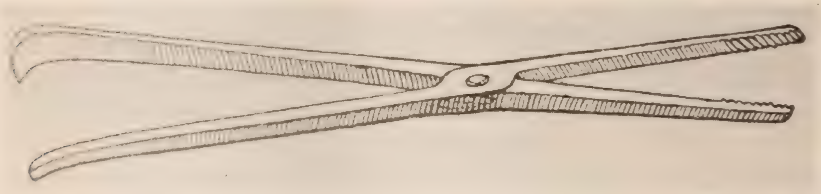


Fig. 5—The forceps called "stork's bill," as represented in Giovanni d'Arcoli's work. Forcep pro extrahendis fragmentis quod Rostrum Ciconiæ dicent.

Lecluse, another famous French surgeon, 1754, drew attention to the elevator, which still bears his name and which is still a very serviceable instrument for various kinds of operations. Really the Lecluse elevator is a modification of another instrument designed by Abulcasis, as seen in *Fig. 2*.

Johann Shultes, 1595 to 1645, presented a work called "Armamentarium Chirurgicum." It contained many illustrations of surgical and dental instruments. Many of these instruments were modifications of dental instruments already in use.

An interesting feature of history in this respect tends to reveal the fact that for centuries the barber was a thorn in the side of the surgeon and dentist.

Again we hear from Abulcasis counseling that teeth should not be violently removed after the method of barbers. He also slyly refers to the inefficiency of the tonsorial artist when he implies that they often remove the wrong tooth.

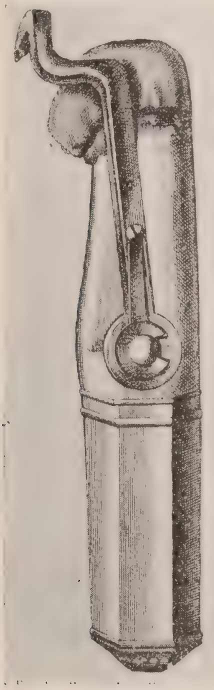


Fig. 6

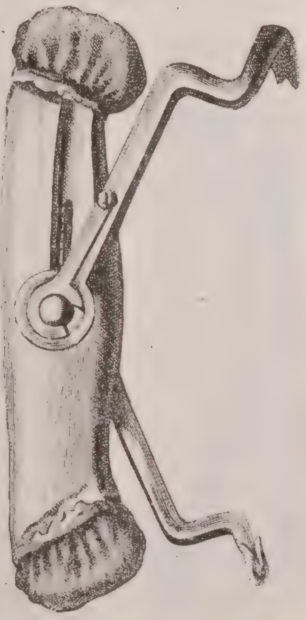


Fig. 7

Fouchard, 1690 to 1761

Barbers in France, Germany and England were the members of society who removed the aching tooth for the populace. In England they had a society of barber surgeons. This society existed in quite recent years. Some German barbers even wrote upon the subject of extracting and two in particular took issue with the ancient theories in regard to lancing the tooth and loosening the soft tissues before the tooth was removed; they claimed this to be an entirely unnecessary procedure.

In the United States the barber was transplanted as a tooth puller, and up to twenty-five (25) years ago many German barbers maintained cases of extracting forceps, and practiced extraction in addition to their hair cutting. This practice ceased only with the passage and enforcement of laws governing the practice of dentistry.

To American ambition alone dentistry owes its present state of development.

Chapin A. Harris and his associates established the first dental college in the world, in Baltimore, chartered in 1839, after all efforts had failed to install the systematic study of dentistry as a specialty of medicine, in cooperation with the medical profession.

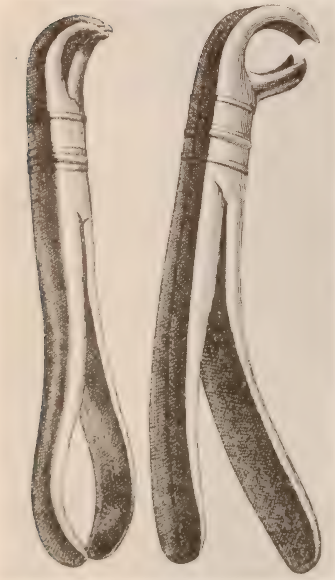


Fig. 8

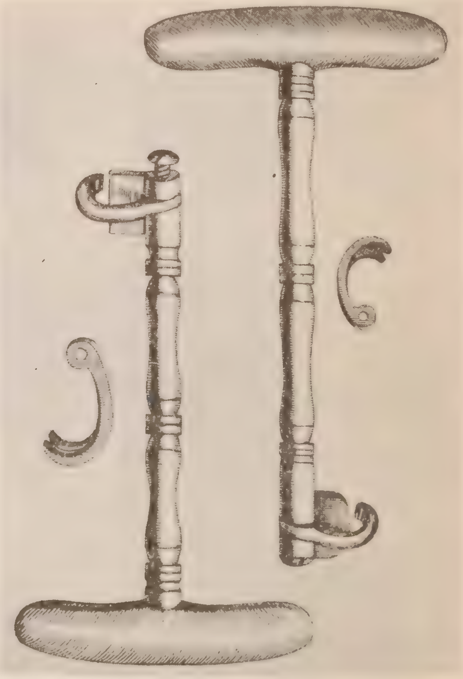


Fig. 9

Fig. 8—Dental Forceps (Fauchard.)
Fig. 9—Two key instruments with changeable hooks (Campani.)

From time to time great men are raised up to accomplish some special deed or service, and Harris appears to have been endowed especially for this great work of organizing and laying the foundation upon which present-day dentistry is founded.

For many years before the organization of this college he had been a studious worker, and his efforts are responsible for the production of many foundation principles which are accepted even today.

At a time when every medical man seemed to believe that every bit of knowledge which he gained should be guarded carefully from his fellowmen, Harris believed in cooperation and, as a result, America, the Infant Republic, took the lead in all things pertaining to dentistry, because of the prodigality with which this man circulated his knowledge.

Through his cooperation with Snell and Fitch was developed the forceps, which were the originals of the standard patterns produced by our best manufacturers today. (*Fig. 10*). These were employed first about 1832, and were the first instruments of sufficient (*Fig. 11*) perfection and applicability to successfully supercede the (*Fig. 12*) barbarous key. He advised the set of seven, which could be adapted to every tooth in the mouth. (*Fig. 13*).

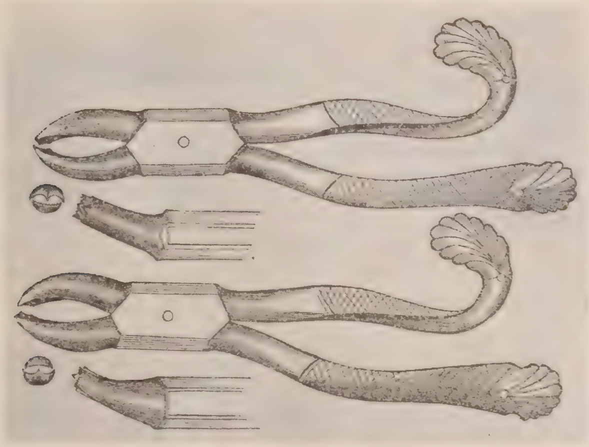


Fig. 10—Chapin H. Harris' right and left upper molar forceps.

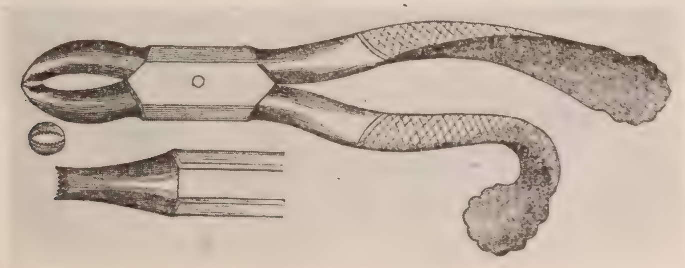


Fig. 11—Harris' forceps for incisors and cuspid.

In the Museum of the Baltimore College of Dental Surgery there may be seen original instruments used by Harris for extracting.

It is indeed strange that the importance of tooth infection and tooth extraction were given so little consideration, except by a comparative few, until within the last few years. Some few could always be found who believed that infection of dental origin was responsible sometimes for certain general physical ills, but the majority of dentists and physicians not only did not believe this but ridiculed such statements.

Things have changed, however, and we are on the opening of a new era.

It has been pretty well instilled into the minds of the rank and file of progressive dentists, that tooth infections are to be considered in their true light as a grave menace to life and health. It has not yet been demonstrated forcefully enough that the extraction operation must, in the future, be clothed in more importance as a surgical measure. This will result only in due time, because the public mind, or any part of it, is not changed suddenly, and the dental profession can be relied upon to present forceful arguments as to why we should let what is supposed to be "well enough" alone.

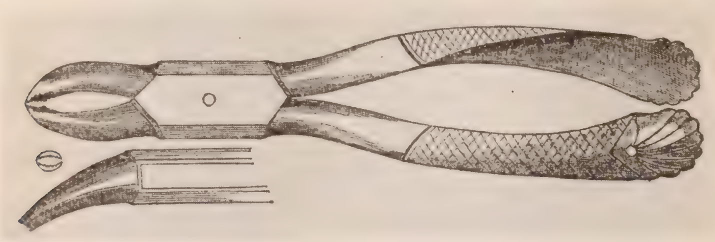


Fig. 12—Harris' forceps for lower incisors and cuspids.

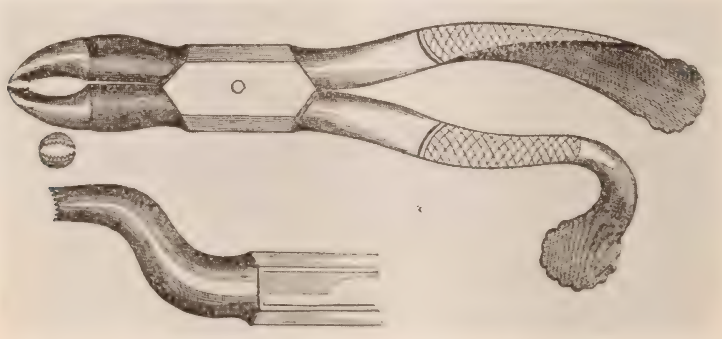


Fig. 13—Bayonet forceps invented by E. P. Church about 1830, for extraction of upper and third molars.

Pathology, bacteriology and the X-ray have made possible the marked advances which we have noted in the study of dental infection. They are being called upon more and more to enable the diagnostician to fathom the nature of suspected dead teeth and gum infections arising from irritation produced by foreign substances.

In this way we are day by day being shown that simply the drawing of a tooth from its socket and calling our work done is not enough.

Nearly all apical infections are by nature impacted infections, existing in the cancellous structure of the process, in one form or another, according to type and the length of time they have existed. To extract the tooth will give relief from pain and, in some cases, will remove the infection, but in many instances this will not be so, as the infected growth will not come away attached to the root, but will remain imbedded in the bone, sometimes, with tentacles extending and ramifying into the minute cancellous alveoli.

Some types of these growths gradually are expurged until after a matter of days or weeks they are found to exist entirely upon the surface, but other types will not so easily be cast off. Instead they hang on and in many instances the soft tissues, and occasionally the bony tissue, completely close over the infection, recreating the same condition as existed before the tooth was extracted.

While the socket remains open there is drainage and patients profess improvement in health and recovery from morbid conditions suspected to arise from these foci of infection, but when the tissues close over the infected area and the patients health reverts, the overlying tissue seldom betrays by inflammation, the true condition which exists underneath.

For this reason, extracting in the future must be practiced to a degree of surgical exactness that will include removal of the infection as well as the tooth. In this way only can the present day dentist claim superiority over his ancient predecessor.

Extraction must be regarded as a surgical operation, minor or major as the case may be, and it must be performed with percision and thoroughness. No guess work can be tolerated. An operation once commenced must be carried on to the very end; whether expediency dictates that end to be achieved at once by surgical measures or led to gradually, though subsequent measures must depend upon the surgical sense and judgment of the operator.

Rose Building.

To Confine Solder to One Spot

Paint the parts to be protected with yellow ochre water-color· Whiting will work the same way, but flakes off when heat is applied, which is not the case with the yellow ochre.—*Oral Health.*

Extracting Upper Canines

Sometimes these are very difficult to extract. When removing the upper teeth for a plate, remove the teeth on either side of the canine and grasp the latter at the sides—the forceps will not slip and the tooth is easily removed.—*Oral Health.*

THE NEW ATTACHMENT FOR THE GYSI SIMPLEX ARTICULATOR*

BY DAYTON DUNBAR CAMPBELL, D.D.S., KANSAS CITY, MO.

SPECIAL LECTURER DENTAL PROSTHESIS, KANSAS CITY WESTERN DENTAL COLLEGE;
FOUNDER AND PRESIDENT OF CAMPBELL SCHOOL OF PROSTHETIC TECHNIC

IN DISCUSSING the subject of articulation in the February number of THE DENTAL SUMMARY, we suggested incidentally that the dentist himself very easily could construct an articulator for his purposes. A supporting frame for the casts, a universal joint together with some form of guide cup and pin, and a "prehensile" shifting of either upper or lower frame—constitute an efficient articulator. Stress was laid upon the fact that opening and closing movements and centers of rotation for the lateral movement are of no practical importance.

Paradoxical as it may seem in view of the emphasis we placed upon the value of a universal joint, the Gysi Simplex Articulator with no universal joint, answers all of the requirements of the practical prosthetist, except his need of a guide-cup and of a prehensile movement. The new attachment, which supplies both of these requirements, is the subject of this article. The attachment is patented, not for financial profit, but for the purpose of preventing its exploitation by others. The patentee grants permission to any dentist who may desire to construct one of these for his own use, and for that reason includes among these illustrations working prints for its construction, or the writer of this paper will direct anyone who may wish to have his Gysi fitted with such a mechanism. *Figures 1, 2, 3, 4* present the working prints for constructing the attachment. *Figures 5 and 6* show views of the Gysi Simplex fitted with attachment. The attachment may be fitted to various articulators. *Figure 7* shows it fitted to the Snow Acme Articulator, while *Fig. 8* shows the Kerr Articulator similarly equipped. The patentee states in the Letters of Patent (No. 1301817) that the special object of the invention is "to produce an articulator in which the tooth cusp is utilized as the guiding factor in mandibular movements, thus ignoring condyle devices and avoiding preliminary adjustments for the accommodation of individual cases, and to provide dentures which determine the mandibular movement as distinguished from articulators which provide dentures to conform to individual condyle path movements."

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*This is the third of a series of twelve articles being written by Dr. Campbell, for the 1920 volume DENTAL SUMMARY.

*EDITOR'S NOTE:—Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

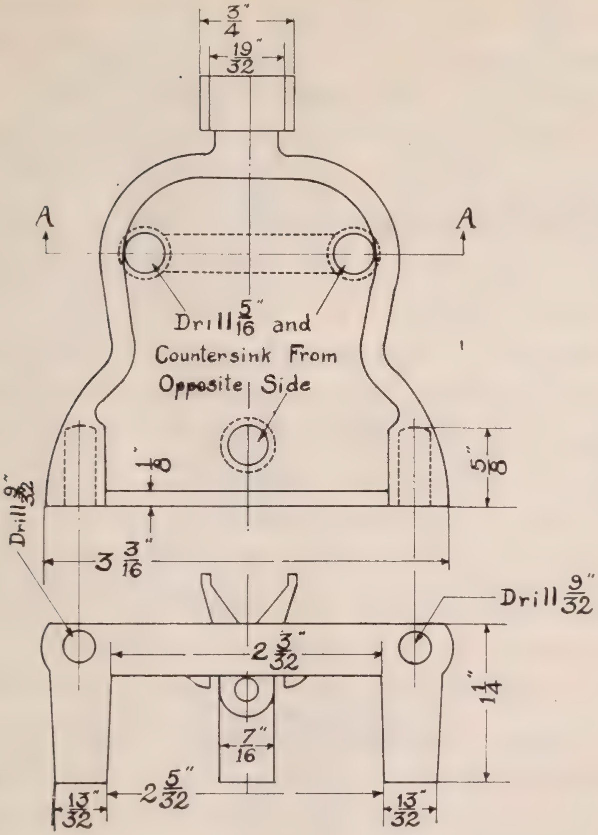
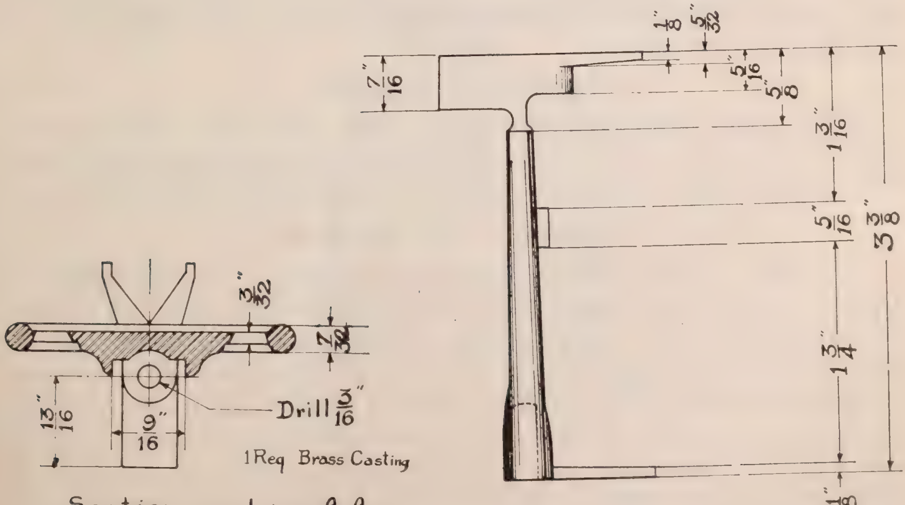


Fig. 1



Section on Line A-A

Fig. 2

The chief merit of this attachment is found in its ability to supply a positively regulated antero-posterior movement analogous to the forward-backward movement of the human mandible, thus permitting a deep over-bite and affording pronounced incisive action. The inclination of the condyles of the articulator, a feature vital to the Gysi method, is to be ignored completely. The incisal guide-cup provides for the cutting of a deep cusp at will of the operator, who may vary the cutting from a very deep to an almost flat cusp by raising or lowering the incisal guide-pin, while the extended sides of the guide cup prevent the pin from leaving the cup, and thus avoid fracturing the teeth during the automatic grinding process.

This attachment is designed to employ an arbitrary tooth cusp relationship as the guiding factor in movements of the mandible, and then to perfect this relationship through automatically grinding the cusps to a more harmonious and synchronous alignment. That is, the dentist may set up the teeth and grind them to any depth or tooth shape that seems to him to be the depth or shape required for this particular case, and then may confidently rely upon them to function properly.

Figure 9 shows diagrammatically why an articulator, such as the Gysi Simplex, which describes very short arcs (e.g. arc OA from a center B and arc OG from a center C, constituting the "Gysi Gothic Arch," which is described by all articulators having two oscillating centers, as well as by the human jaw itself), is as efficient as an articulator that is capable of describing a complete circle; (a portion of this circle is represented by arc XY from center H). This truth is obvious when one bears in mind, that even though one articulator permits a wider range of movement, the other is just as efficient since it permits all of the movement that can be utilized in masticatory effort. The dotted area in the figure shows the range of movement which can not be utilized by the jaw.

MOUNTING THE CASTS

After sealing the bite-plates to the casts, mount the case as usual, observing the marks which serve to keep the occlusal plane parallel with, and a proper distance from the guide-pin of the articulator, as in *Fig. 10*.

SETTING UP THE TEETH

In setting up any tooth, the operator always should be careful to remove the black wax from the tooth and to melt the holes full or melt wax around the pins. Melting this hot base-plate wax in the hole or around the pins in this manner will prevent the saliva or water used to chill them from getting between the wax and the tooth, thus keeping the teeth more firmly fixed to the base-plate during try-ins. Cut all wax from the base-plates so that the proper relation of the teeth to the ridges may be secured. With the six anterior teeth in position (the setting of which will vary with the esthetic appreciation of the operator),

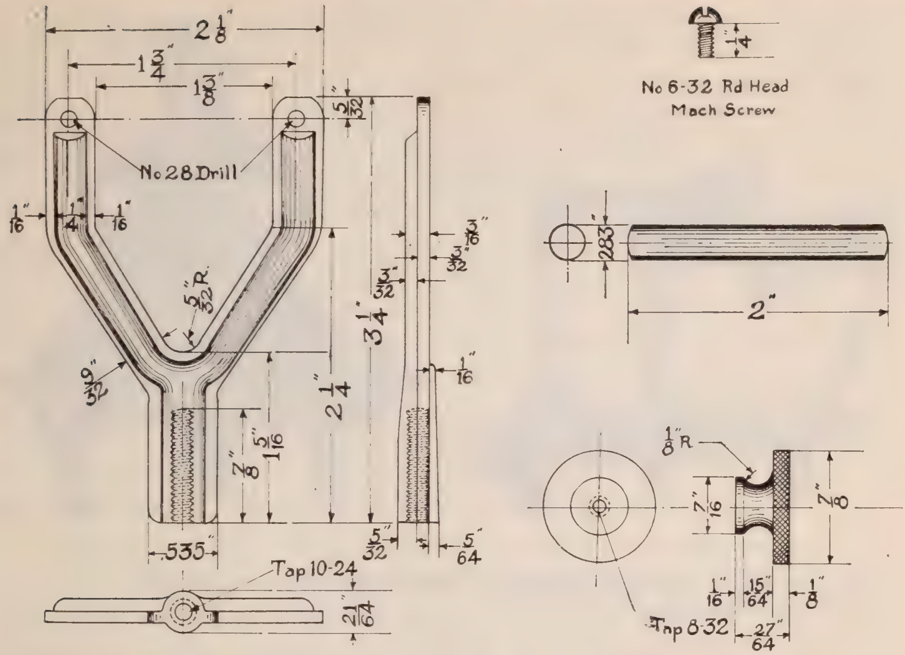
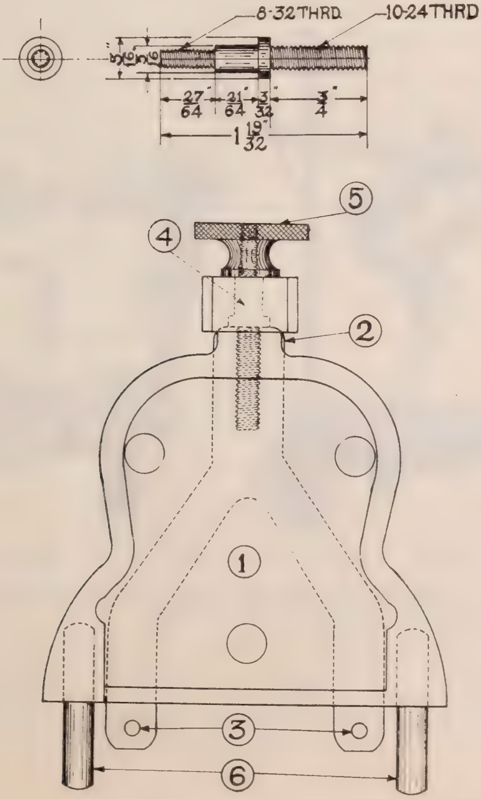

2 1/8"
1 3/4"
1 3/8"
5/32"
No 28 Drill
1/16"
1/4"
1/16"
5/32" R.
3/32"
9/32"
3 1/4"
2 1/4"
5/16"
7/8"
1/16"
.535"
5/32"
5/64"
Tap 10-24
21/64"
No 6-32 Rd Head
Mach Screw
1/4"
.283"
2"
1/8" R
7/16"
7/8"
1/16"
15/64"
1/8"
Tap 8-32
27/64"

Fig. 3


8-32 THRD.
10-24 THRD
3/16"
5/16"
27/64"
21/64"
3/32"
3/4"
1 19/32"
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4
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1
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6

Fig. 4

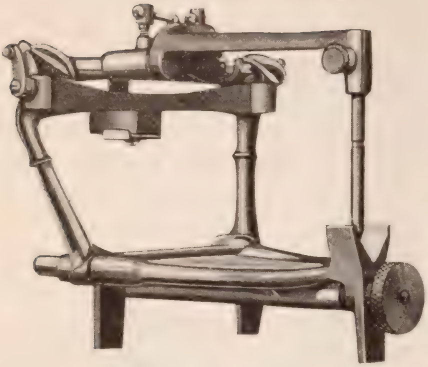

Fig. 5

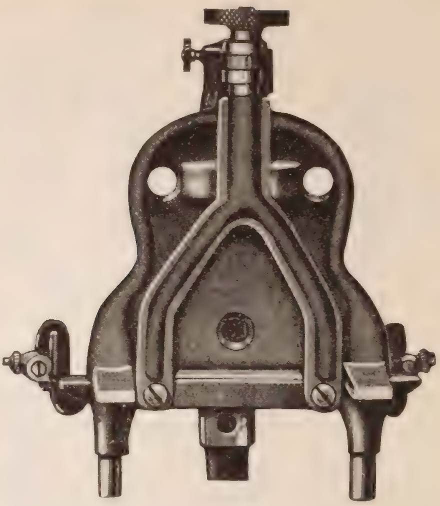

Fig. 6

Fig. 5—The Gysi Simplex Articulator, fitted with the new Attachment.
Fig. 6—Same as Fig. 5. Base view.

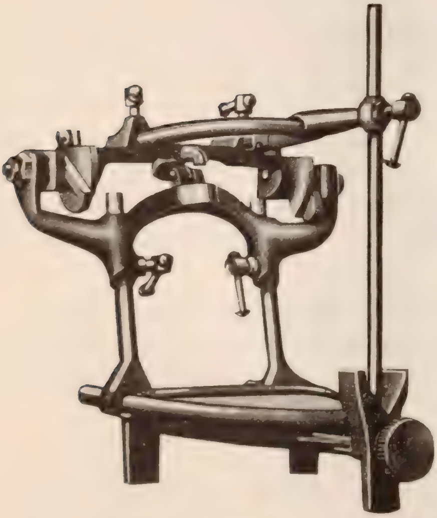

Fig. 7

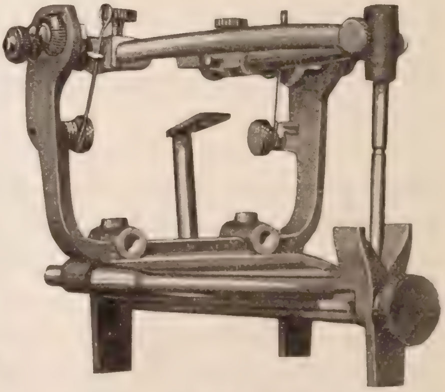

Fig. 8

Fig. 7—The Snow "Acme" Articulator, fitted with Attachment.
Fig. 8—Kerr Articulator, fitted with Attachment.

set up the bicuspids and molars of one side, and then set up the bicuspids and molars of the other side. The six anterior teeth are very advantageously set up in the mouth on bite-plates of standard material not affected by the temperature of the mouth during the process of taking the bite. The position of bicuspids and molars with reference to the ridge always should be the same in all cases. In setting up the bicuspids and molars they should be so arranged that a line drawn through the crests of both ridges will pass through the long axes of these teeth. *Figure 11* shows correct position of these teeth. The first bicuspid when placed in position should be rotated until only the anterior portion of its buccal surface appears when viewed from the median line; when the posterior buccal surface also appears this gives the whole set-up an appearance of "too much teeth." "Hide the bicuspids behind the cuspids" is a good rule to follow in the majority of cases. The second bicuspid will be so placed that a straight edge laid against the buccal surfaces of the bicuspids will touch the cuspid.

SETTING UP THE TEETH—WHAT DETERMINES THE OVER-BITE?

The question as to how deep the over-bite shall be, is determined by the relation of the second molars to the occlusal plane. The more nearly the second molars are inclined to an angle of forty-five degrees with the occlusal plane, the deeper will be the over-bite; while they are often inclined at this angle, it never is exceeded. A deep over-bite adds "shearing" power to the teeth and, except in rare instances, always is indicated; a deep over-bite does not, however, necessarily mean deep cusps, the latter varying most perhaps with the age of the patient, and the flattened condition of the ridges.

With the jaws of the articulator open, put the lower second bicuspid into position between the two upper bicuspids and hold with the fingers while determining the occlusion. (The writer knows of no teeth on the market which do not require some grinding in order to obtain a fine occlusion. The extent of grinding required will be found by using carbon paper, and in many instances careful operators will want to place a mixture of glycerin and No. 120 carborundum grit between the teeth, and as each tooth is set up, will, while holding it between thumb and fingers, automatically grind it into position). After cleaning the surfaces of the teeth, the lower is held in articulated position, while with a thin film of very hot wax the occlusal surfaces are sealed together.

The jaws of the articulator are now closed and the lower second bicuspid takes its proper position with reference to the ridge where it will now be securely sealed, after which the thin film on the occlusal surface will be released with a hot blast from the chip blower. Repeat this operation for the remaining bicuspids and molars, following this order: First molar, second molar, on the other side second bicuspid, first molar, second molar, first bicuspid, then finishing with the first bicuspid of the

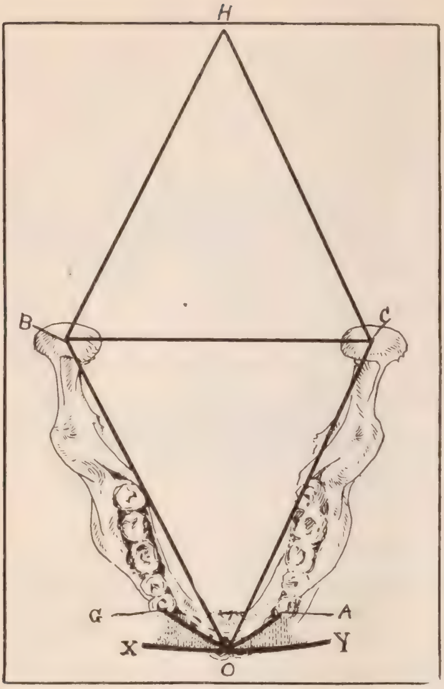

Fig. 9

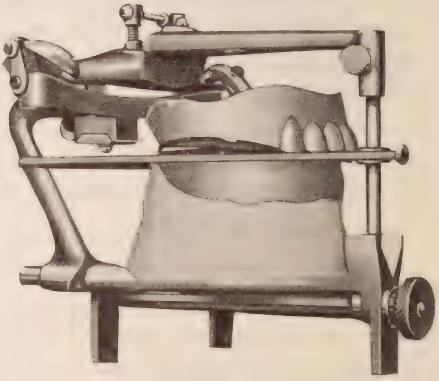

Fig. 10

Fig. 9—Diagram showing that articulators capable of describing arcs of small circles are as efficient as an articulator capable of describing a complete circle. The masticatory movements of the jaw cannot avail themselves of the larger range of movement indicated by dotted area.

Fig. 10—In mounting casts, the occlusal plane should be parallel with the jaws of the articulator. The Gysi articulator is manufactured with marks that indicate proper position of casts.

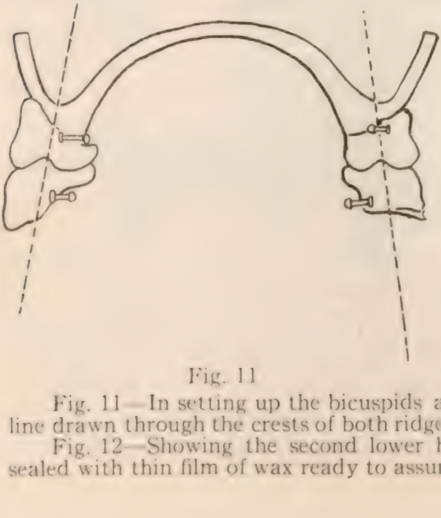

Fig. 11

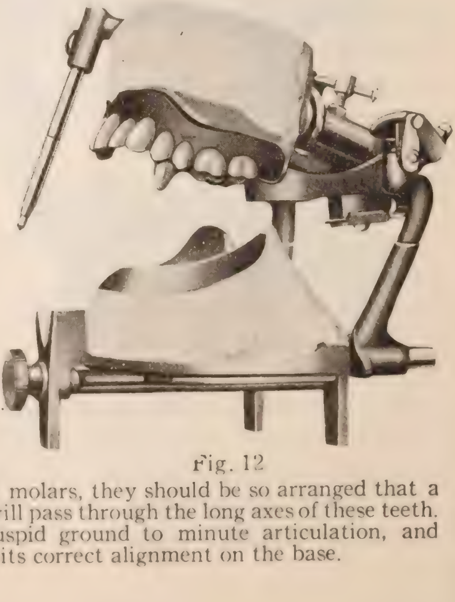

Fig. 12

Fig. 11—In setting up the bicuspids and molars, they should be so arranged that a line drawn through the crests of both ridges will pass through the long axes of these teeth.

Fig. 12—Showing the second lower bicuspid ground to minute articulation, and sealed with thin film of wax ready to assume its correct alignment on the base.

beginning side. The lower cuspid is in correct position when upon opening and moving laterally the jaws of the articulator, the vertical axes of upper and lower cuspids will come to make a continuous straight line. *Figure 13* illustrates this position. The four lower incisors are placed in the space remaining between the cuspids, but when this space is not wide enough to accommodate the four incisors which are sold carded with the set, smaller ones may be substituted or one may be omitted. To find the correct position of these incisors and at the same time to determine the correct over-bite for this particular case, the lower bow of the articulator is brought forward by turning the thumb screw to the left until an "end-to-end" occlusion is obtained. This may require the operator in many instances to readjust the inclination of the four second molars; while the operator may be tempted to raise or lower the lower incisors, this should be avoided because their position already has been pre-determined with reference to the lip line. The operator will note that between the first and second lower molars a space is left. With the present forms of teeth, this space is to be desired since it necessarily results from properly setting to a curve on the bases, teeth that have been manufactured to set on the occlusal plane.

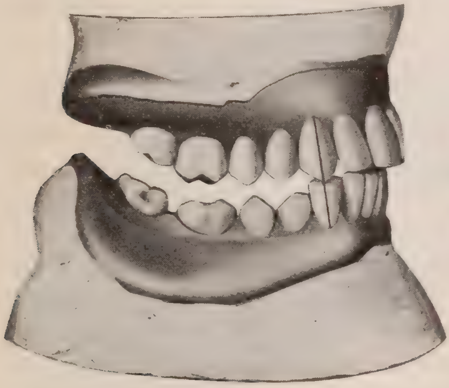

Fig. 13

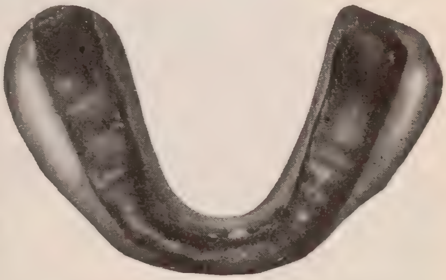

Fig. 14

Fig. 13—The lower bicuspid is in correct position when, upon opening and moving laterally the jaws of the articulator, the vertical axes of upper and lower cuspids will come to make a continuous straight line.

Fig. 14—This shows the roll of black wax flattened over the lower occlusal surfaces in preparation for bite.

The lower bow of the articulator is now returned to its original position; the case is removed from the articulator and tried in the mouth to verify the occlusion. There is no advantage in testing at this time either the lateral or the incisive bite, because the planes of the cusps are not yet ground sufficiently.

After the teeth have been vulcanized and finished, they are again placed in the mouth and any mal-alignment which may have occurred in the process of closing the flask by those operators who do not stress the importance of closing the flask properly, is detected with carbon paper and as a preliminary to the automatic grinding process is removed with the use of a small carborundum stone in the hand-piece.

Removing the lower from the mouth, dry the surfaces of the teeth carefully and place upon the surfaces of all the teeth and extending back over the heel of the vulcanite, a portion of black carding wax, rolled to the size of a lead pencil. Flatten the wax to a uniform thickness of about one sixteenth of an inch, as shown in *Fig. 14*.

Return the lower to the mouth and again obtain the correct bite. During the winter months and in cases of patients having hypersensitive mucosa, the lower should be inverted in a pan of warm water until the wax is very soft, almost mushy. Remove the dentures separately and examine the lower, noting where the cusps show through the wax. *Figure 15*, pictures the cusps showing through at three points.

A pointed instrument is often an aid in determining this. While it is absolutely essential that one point of contact show through the wax as evidence that the jaws have been closed sufficiently, to obtain two, three or four points will be more gratifying to the operator, in that it will prove to him that discrepancies which could have developed in closing the flask have been almost wholly avoided. In order to insure two points, mark with an indelible pencil the place that shows on first trial, remove all of the wax and grind *out* the pencil mark. *Do not grind off the opposing cusp.*

The dentist is cautioned to obtain only a central or meniscus occlusion. Any lateral movement after the patient closes his jaws, or, in the case of powerful muscles and hardened tissue, excessive pressure exerted in closing will defeat the purpose for which the wax is used. The purpose in using the wax in this fashion is to cover the unprepared cusp planes so as to prevent them from serving as guides in bringing the teeth to occlusion, because while unprepared and unground the irregularities due to this condition would likely misguide the teeth and bring them together in faulty occlusion, or in other words, would result in a "wrong" bite. By cutting away the wax in the region of the bicuspids on one side, while the teeth are still in the mouth, and noting the inter-cuspation, it is possible to see whether the patient has closed correctly.

After securing this corrected bite, the upper also is removed and carefully placed in the black wax on the lower. The case is chilled in water, the excess water is blown off with the chip blower or with compressed air, and the upper and lower are then sealed together firmly with sticky wax.

AUTOMATIC GRINDING

The case again is mounted on the articulator, wet tissue paper being placed in the under-cuts of both upper and lower and also in the vault of the upper and between the lingual surfaces of the lower in order to facilitate removal from the articulator when the process of automatic grinding is completed. When the plaster has hardened sufficiently,

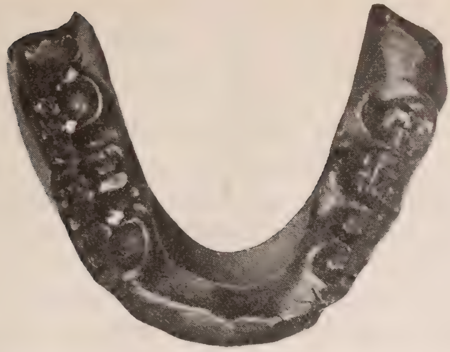

Fig. 15—White spots indicate the porcelain showing through at these points after bite has been taken.

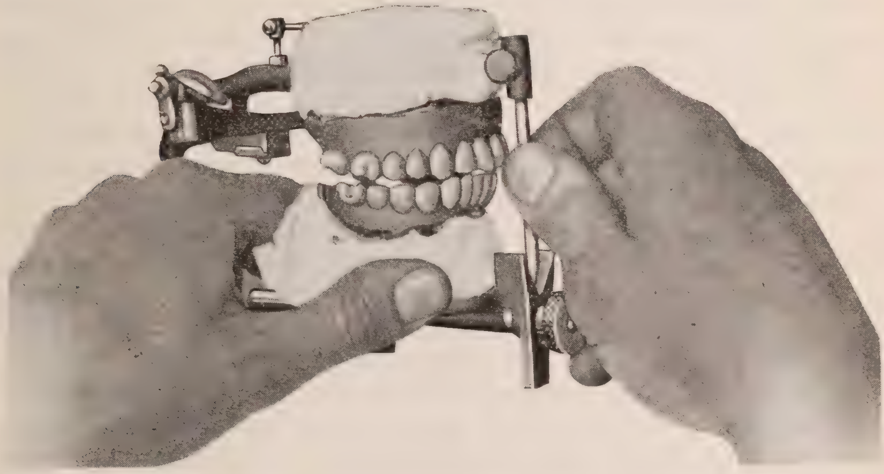

Fig. 16—Correct position during the process of grinding to perfect occlusion.

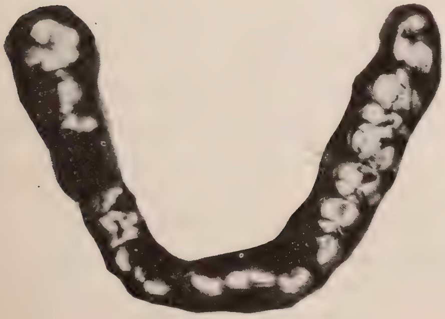

Fig. 17

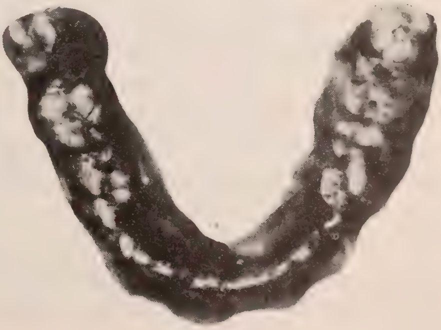

Fig. 18

Fig. 17—A piece of base-plate wax showing imprints of natural teeth (one tooth missing) in final masticatory movement.

Fig. 18—Same as figure 17, but showing the "bite" of artifical teeth after they have been automatically ground on the new attachment.

the articulator is opened and the black wax is removed. (The dentist is cautioned against mixing his plaster so stiff that force is necessary to seat the lower on the articulator. If force is employed it is likely to be exerted against the upper and thus may separate the two slightly). With a mixture, not too thin, of No. 90 or 100 carborundum grit and glycerin, cover the surfaces of all the teeth, using the index finger of the left hand, which leaves the right hand free to manipulate the guide-pin without allowing the mixture to drop into, and cut the walls of the guide-cup. The mixture will be applied from time to time throughout the process. The carborundum may be obtained at any hardware store and the dentist should be sure to get carborundum instead of emery powder. The latter is a much slower abrasive and practically useless for this purpose.

Figure 16 gives the proper position in automatic grinding. The guide-pin, firmly fastened in the upper bow, is moved up and down along the walls of the guide-cup until the carborundum powder in its action on the porcelain has cut away the irregularities until the friction is no longer "felt." To say, "felt," is not entirely to employ a figure of speech, because the operator will learn to experience a different sensation in the hand that holds the guide-pin, when the friction ceases as the grinding removes the irregularities. The guide-pin should be moved up and down against one side of the cup five or six times, then against the other side in similar fashion. If, instead of changing to the opposite side after five or six movements, the operator should change to the opposite side after each movement, this will have a tendency to round the cusps rather than to produce in them the angle desired. When the friction is no longer felt, the guide pin is moved up or shortened one or two millimeters and the grinding process repeated. The guide-pin is raised and grinding repeated through successive operations until the occlusion meets the requirements of the case. This may be called grinding to perfect normal occlusion.

In grinding to incisive balance the process is continued in the following manner: The guide-pin is shortened until it comes above the cup; the lower denture is brought forward by turning the large thumb screw to the left until the incisors will be almost but not quite "end-to-end." Sometimes the posterior teeth will not permit the incisors to touch; when this is found to be the case, it is better to grind out the occlusal surface of the lower molar rather than to cut off the lingual cusp of the upper molar, since the latter is essential in balancing the occlusion. With the incisors ground to a shearing surface, the triturating movement is continued, and at frequent intervals the large thumb screw is turned a half turn to the right, thus returning finally the lower denture to its original position, that is, to the position of proper bite.

In finishing the grinding it is well to bring the lower bow out and back a second time, completing this operation in one-fourth or even less time than the first operation required. The whole operation of automatically grinding an upper and lower requires from thirty to forty-five minutes and usually is completed while the patient is in the chair. A photograph of a normal "bite" is given in *Fig. 17*. This is a piece of base-plate wax showing the imprints of the natural teeth (one missing) in final masticatory movement. The imprints show clearly as a result of being photographed against the light. *Figure 18* shows the "bite" of artificial teeth after they have been automatically ground on the new attachment.

It is important to note that the lateral movement of the grinding process is very slight, and that in all instances it is restricted sufficiently to avoid cutting to any appreciable extent the incisal edges of the cuspids. The tendency of the beginner with reference to this most essential process of denture construction is to over-grind, hardy realizing that a few minutes of grinding with carborundum is equal in most instances to the grinding that is done during a lifetime in the ordinary use of the dentures.

In conclusion we may call attention to those cases in which, shortly after the dentures are worn out of the office, a patient presents himself with the lower base irritating some portion of the ridge; the dentist ordinarily relieves this condition by cutting away the base. The patient returns in a day or two to report that the previous point of irritation is relieved, but that another has developed on the opposite side of the mouth. The cutting away of the base again is resorted to as a means of relief, only to have the patient return with an irritation entirely new and we might say remote from the previous ones. When this occurs five or six times without avail, the dentist recalls his college days and the professor's advice about finishing a lower plate—"Trim the lower until you think you have ruined it, then trim it some more." The real difficulty lies in some plane of a tooth cusp. This plane is mal-aligned with reference to the harmonious arrangement of the remaining twenty-seven teeth, and under the stress of mastication the force brought to bear upon this inclined plane causes the whole denture to "skid" or move sufficiently to irritate the mucosa. A case of this kind may be mounted on an articulator fitted with this new attachment and ground as described above obtaining most gratifying results without cutting or scraping the base.

Finally, the most abominable set-up, one which violates most of the principles of good denture construction, will be benefited and the masticatory value of the dentures wonderfully enhanced through this automatic grinding process.

Shukert Building.

INTERPRETATION OF DENTAL ROENTGENOGRAMS*

BY DR. B. H. HARMS, OMAHA, NEBRASKA

THIS PAPER IS A PLEA for better and plainer roentgenograms and to point out briefly some of the things necessary to see on readable films.

In the first place, we must admit that the advance made in making interpretation of dental roentgenograms has been very rapid and that the more these roentgenograms are studied the more we can learn from them. In other words, we see more things on the roentgenograms today than we did a year ago; and next year we will be reading our films even finer than we do now. This has been the case with roentgenology from its beginning, and general X-ray men will tell you that they are continually finding things on old plates taken many years ago which have been there all the time, but which they had been unable to interpret in the past.

It has been said that there are no diseases or symptoms which cannot be demonstrated by the X-ray. And while it is not possible with our present knowledge of intrepertation of X-ray films always to demonstrate this fact, there may come a time when this statement will not sound as absurd as it does now. This all means that planer and more readable roentgenograms must be made, and, most of all, better interpretation.

Bear in mind always that roentgenograms are only shadow pictures and show only the various densities of the parts through which the rays pass. As for instance, dental roentgenograms. If the tooth contains a metal filling or a crown this will be the dense object through which the rays will pass, and, consequently if the exposure has been properly made, it will appear on the film as a white object, due to the fact that very few rays have penetrated this dense object; next in order will be the tooth and its various parts, bone and gum tissue; and next, possibly, such changes in these structures that result from pathology or any other agent which has caused the structure to be of less density than normal. And it is by comparing the normal with the abnormal parts and checking our findings clinically that we are able to interpret the roentgenograms properly. And, let me add, right here, that all interpretation of X-ray films should be *checked by the clinical findings.*

I, for one, object very strongly to the things which have been said and written by some as to the interpretation of dental roentgenograms; for instance, we hear where this or that man says that this or that tooth shows pus, to use his terms. Gentlemen, this is a misstatement, and no one who is intelligent enough to be a dentist should be guilty of using such a term. If by such a statement you are referring to the large rarefied area which is seen at the apical ends of many teeth that have been abscessed, I wish to state that it is a gross misstatement, and that the rarefied area is not pus, but, the possible destruction that pus has done to that area of tissue, causing it to be of less density. The pus may be all gone by the time the film is made, and a hole drilled into the bone at that point would look exactly the same on the film.

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*Read before the Nebraska State Dental Society, 1919.

Another statement is this: it is doubtful that all rarefied areas contain pus. Dentists continually are remarking how they extracted this or that tooth because the film showed a large black spot over the end of the root, and, after all, did not find any pus. Let me ask, are you extracting to relieve an abscess or to eliminate a focus of infection? As I intimated a few minutes ago, the pus may be absent, at least to such an extent that you cannot see it, but the focus of infection is still present.

At this time it may not be out of the way to define two terms for you:

First: An abscess is a circumscribed area of tissue *containing pus*.

Second: A focus of infection is a circumscribed area of tissue containing *pathogenic* micro-organisms.

An abscess usually contains pathogenic micro-organisms, but a focus of infection does not necessarily need to contain pus.

For this reason it may be well to bear in mind that it is not necessary to demonstrate by the X-ray that teeth must show a large rarefied area over the ends of the roots before it can be said that such teeth are the cause of some systemic condition. A focus of infection may be so small that even an expert may not detect it on the film, and, still, it may be of the most virulent type. In other words, gentlemen, to use a slang phrase, it is a case where quality counts, not size.

A properly-made roentgenogram should not be so black that one needs a high-power light to see through the film. In X-ray slang, it is said to be burnt up, meaning that it is over-exposed, over-developed, over-penetrated or any one or all three of these things. Or, on the other hand it should not be so light that only the less dense objects are outlined.

A properly-made dental roentgenogram will show a tooth in detail, bone with its various striations, and if it is in that field, the soft tissues such as the gum and lip outline. It is then, by comparing the normal parts with the abnormal parts, that we can determine what changes have taken place in the tissues, and by clinical conditions, checking up our operative findings, and by the study of pathology, we can determine just what has caused these changes. It should be made plain, that tissue changes, due to other than that of infection, are demonstrated by the X-ray, and when making an X-ray diagnosis this point should be borne in mind always.

Strange as it may seem, the X-ray has been and is much abused. The roentgen-ray never was intended to reveal the exact pathological findings at the root ends. The best that it can do is to aid us in our various tests to draw our conclusions. No man has a right to base his treatment on the reading of an X-ray picture without taking into consideration the various tissue changes that may take place. When men have a true understanding of the tissue changes that take place in acute and chronic inflammation, and are familiar with the histopathology of morbid conditions involving root ends, then, and then only, can they realize that the tissue change involving root ends in a radiograph does not always mean a root abscess, or a blind abscess; that the dark area may be nothing more than less density of the tissue, an epithelial root tumor, a root cyst, an apical osteitis, osteitis fibrosis systica, a rarefying apical osteitis, a root-end necrosis, a root-end cementoma, or proliferative pericementitis. Unless a man has an understanding of these various pathological manifestations he has no moral right to interpret dental radiographs.

DISCUSSION

DR. BROWN: Ofttimes pictures thrown upon the screen will not bring out everything just exactly as you wish them to. Most of you have seen a great deal of Dr. Harms' work and you will all agree, I suppose, that his work is far above the average. In other words his plea for better films and better pictures is certainly a plea that is very timely. One of the most discouraging things that we come up against in our practice is to have pictures brought to us that have been taken by other men. I will say that for pictures I have taken myself, because I have taken a good many poor ones, and I think any man who has taken many radiograms will find there are a great majority that do not score up to what they should; but that is one of the perplexing things today, the poor pictures that we have. We will take a shot, as we say, and it does not give us what we expect and we are a little bit lax and do not take another exposure, if necessary three or four from different angles and from different positions. I am rather crazy myself on the position proposition. I think there is a great deal in position when it comes to getting a proper picture that is readable. I don't think any of us have to have any great amount of experience to arrive at that conclusion. A picture, really, as the Doctor has said, is nothing more than a shadow, and I believe that most of us have eyesight that will tell us the difference, if the shadow is really different in black and white. And the thing that so many of us look for, as the Doctor spoke of, is a great large area, or we cannot see anything. The thing that we want to teach ourselves to do is to find the slight variations in tissue and the little tissue disturbances and tissue changes. Many of the leading men of the country have told us that it is not the tooth that looks the worst that does the most damage. In fact, in a great many instances it is the tooth that has the smallest area of infection that is doing the greatest amount of damage. You need only to do a little experimental work in the removal of these foci, by removing the worst looking ones and leaving the smaller ones, and the patient does not respond and later on remove the smaller ones and the patient does respond. That brings us up to the proposition: What are we going to do with these teeth that look as if they are doubtful. They are on the dividing line; will we leave them or will we not? We have our radicals in both directions, those who will say, "remove all devitalized teeth." Others will be more conservative and conserve every one they can. We have others who will take the easy road and they are quite safe in a way, for they are playing safe. I have to admit that I am somewhat in that middle road myself with a tendency toward removing a little more than we did. The reason that comes about is this: Dr. Harms for instance, in his work, probably sees a great many more of the extreme cases than the man in general practice and you will have to ask yourselves the question, "Why is it that some of these men are saying, 'extract all devitalized teeth'?" For instance the Mayos: I have been informed that they have taken the stand to remove practically every devitalized tooth. That does not come directly to me from them, but through others and I don't think it is disputed. The Mayos see a different line of patients than the general practitioner does. They see people who have no time to take any chances because the general health is becoming impaired, and they are immediately after eradicating every possible source of infection. When the patient is sent back home and the dentist will have the X-ray film he will say, "I can't agree with the Mayos; I cannot take that tooth out." Well, the serious thing that comes up is, you ask yourself about the question of this patient's health and there is where it bothers us when it comes to reading the film and saying what we would like to do. Ofttimes, you know, there is a tissue change but you cannot make up your mind what to do after you find it. So I don't think myself it is so very hard for the majority of us. I think it is within the power of any graduate of a dental college or practitioner today, with their present knowledge, to read these dental films if they only will train themselves. You are bound to make a few mistakes. Dr. Harms will make some mistakes. I was in Dr. Simpson's office in St. Louis, who devotes all of his time to this work; he will make some mistakes; I know it; I have tried it out in my own mouth. We will all do that very thing; so don't think that some of these fellows are infallible. The majority of the cases you can read yourself; some few of them you will fail on, and some that you will not be able to find any two men that will agree upon. So don't get discouraged about this proposition but go to it and do all you can and learn to interpret these films the very best that is in you. Some of us get rather a narrow view-point sometimes and we just cannot put ourselves in the other fellow's shoes. Take the man for instance out in the state; the men out there are not able to do X-ray work and are not where they can even get it unless they send their patients some distance, which we know is often a hard thing to do, and they do not come in touch with a great many X-ray films to read. They get the magazines and see the cuts and so forth but that is not exactly the same as having a picture and reading it yourself, because the best way is to have the film in your own hands and not by a print. A great many are out where they haven't X-ray machines; they probably never will become efficient in interpreting and reading X-ray films, but do your best and keep yourself well-informed and I can see no reason why it is any great trouble for any man to interpret X-ray films. Now the treatment is the thing I find that is puzzling them all because the minute you tell a man what is being found he will say, "What would you do, Doctor?" That is up to you fellows individually. That is the great problem that you are to solve—what you are going to do with it after you find it. And don't condemn the fellows who are extracting the teeth until you have solved your own problem too. That is the one great study I think that the profession has got to do, is the treatment after you have found it. Don't rely too much on your X-ray films because they are just as deceptive as anything could be, because many a time a tooth will look all right while if taken at a different angle you will get a different picture, which will show an entirely different condition. As the Doctor has told you, no man has a right to rely on any of these conditions without having a clinical examination along with the history of the case. If I were going to take my choice in diagnosing a case in the mouth, and had to do away with anything, I would rather do away with the X-ray and do my diagnosing from a clinical examination and the history. The X-ray is a thing of great good and one that we can hardly get along without and I am glad we never will have to. It has been one of the greatest things to help us diagnose these things, but the thing is, don't let it be the whole thing when it comes to diagnosing trouble.

DR. DESPECHER: This subject I might say is exceedingly interesting to me and to most of us. I want to begin the discussion by complimenting Dr. Harms on the beautiful work that he has brought before us. The few pictures that Dr. Harms showed us were so exactly complete that they exemplified all we should know and look for in the X-rays. Dr. Harms has tried to bring before us the necessity of knowing the mouth and teeth, and being expert in the work before being able to interpret a dental radiogram. Today we are getting radiographs that are sent to us from many sources and I have no doubt some of them are doing more harm than good. I have had a few experiences in my practice that have brought that very thoroughly to my mind. We get a report from an expert radiographer saying that such and such a tooth has a rarefied area, leading us to believe that it is a pulpless or a non-vital tooth. This man has only taken his own interpretation of the shadows on his plate. The shadows shown on his picture may be correct or they may be erroneous. You may take two exposures and have two radiograms of the same tooth under exactly the same circumstances, and one radiogram will show shadows and the other one will not; showing that we must rely on our clinical ability to diagnose the condition of the tooth, regardless of the radiography, and take more radiograms of that tooth to make certain before we go ahead.

I want to bring to you an illustration of this, which happened to me a few days ago. A patient, a lady, came to see me with radiographs of her mouth; the teeth were crowned, nearly all the molars were crowned and the interpretation of the radiograph read that there were rarefied areas and pathology at the apex of each tooth. All of you often have seen these reports saying that those teeth ought to be extracted. This lady was referred to her dentist who looked at the report and he said, "These have to be extracted." I have a habit in my office whenever one of these reports come, I take it and lay it face down on the table and never look at it; so I did not see what it was before the lady's mouth had been looked over carefully. After the examination I was very much in doubt if any of these teeth were dead, and I told the lady so. "Why," she said, "I have been advised to have these teeth extracted." I removed all the crowns from the teeth and of all these crowned teeth there was only one tooth that was pulpless or devitalized, all the other teeth were alive and in perfect condition and preservation. Many of the teeth had been crowned without having even a suspicion of a cavity, showing that this person would have had all her molars extracted through the report of a radiographer who did not know dentistry. And whenever a report of this kind comes to you, lay it down as I do, and take your own advice, not the advice of one who does not know (this is the value that I give the radiographer's report). Radiographs are all right when they are sustained by clinical verification of what you see, for then you may depend on them. I hope, and I think that the Doctor has given you to understand that very point.

Another thing is that in radiographs taken at different angles one will show rarefied areas and the same picture of the same tooth taken from another angle will show no signs at all of pathology. So, we must not depend on one picture or on one radiograph for a positive diagnosis. If we see that there is a large area on the root, we know it is there unless it looks like an air bubble in the film, or something that we would have no control about, but these defects you ought to be able to recognize. There were a few points in the pictures that were shown that I want to speak to you about. First of all, the slide that was shown of the mesial root of a molar which was inclined and had moved out of its place, showing the dark line which is shown on the radiograph of which Dr. Harms spoke. I find, and I believe, that these areas always, or, in most instances, appear on any tooth that has moved. I often have been asked this question, "Do these teeth show any areas caused by the motion?" I said, "Yes, but it always shows in the direction in which the tooth is moving." It is filling in in the back, and the filling back process goes on very much faster than the taking away process, so they have no demarcation in the direction from which they are coming, only in the direction they are going. In other words, we see no demarcation from where the tooth is coming but where it is going. The tissues where it is going are rarefied and we find these are as are ofttimes exceedingly well marked. To find them the radiograph must be carefully taken; it must be taken exactly at right angle to the line in which the tooth is moving before it will show. I have found these same areas in teeth that were growing, teeth which were in the course of eruption. That is why I say that many of the impacted teeth which we see, that seem to have large rarefied areas, which often are called pathologic have no pathological conditions whatsoever. When we extract these teeth we find that the tissues are in perfect condition and adaptation, and that we have no symptoms of granuloma or pus, no signs of any pathological condition as far as we can see. I do not mean microscopically but with the naked eye. These tissues I have examined frequently and often it is very hard to say what they are. Now, I believe that these areas that we find around these unerupted teeth are the result of nature's having destroyed the bony tissues trying to help that tooth to come out, and not being in proper relation, they have been retarded and stopped in their eruption. So, I believe before we should call these areas pathologic we should study them very carefully. There are many instances in impacted third molars where these areas are pathologic, especially where there is a pyogenic pocket between the second molar and the erupting or the impacted third molar; there we have a loose gum and we find, from our clinical observation, pus and a pocket and we know that we have a pathological condition; but where there are no openings I think, in many instances, these areas are not positively pathologic. Another thing is where the teeth have been absorbed and which might show areas we call pathologic. I believe when we see this condition we should look to the occlusion of the tooth more than to the filling. You see, it is usually the occlusal condition which causes this trouble and I think by a little grinding, in many cases, we can relieve that condition.

Dr. Davis: We have before us at this time, presented in an admirable way, the most vital thing of interest to the dental profession today. Depending upon our solution of this very problem and the action we take, are the lives of our patients and our success or failure as dentists. I do not care to have this passed up without having a regular old Irish conference here where everybody preaches. I would like to hear from those of different views.

Dr. Wildman: It occurs to me that it is well for us always to be practical. General practitioners like the great majority of us in Nebraska are apt to be led astray by the enthusiasm of specialists.

Conscientious practitioners are desirous of conserving every tooth that it is consistent to save.

The question is: Shall we permit any lifeless teeth in the mouth?

The Mayo Brothers advise extraction because they have the extreme conditions with which to deal. When the pathology of these cases has advanced sufficiently to cause systemic disturbances then radical measures are necessary.

Will we not do our patients less harm in permitting no lifeless teeth in the mouth?

Dr. Vance: I never see X-ray pictures thrown upon the screen but what I would like to have them held a little longer and opportunity given to ask questions. It is not possible to discuss intelligently a paper of this character without the pictures before us. While X-ray pictures are not infallible yet they are our most valuable diagnostic means today and few of us would care to practice dentistry without them. We must not feel hurt nor chagrined if X-ray pictures taken either by ourselves or some one else show improperly-filled root canals upon which we have operated in years gone by. There does not appear to be a great deal of difference in root-canal work of past years no matter who did it. About nine out of ten nonvital teeth show a diseased condition about the apical region which can only be eradicated by extraction and curettement. You need have no hesitancy about acknowledging that the root-canal work you have done in years gone by was imperfect. You did the best you could under the circumstances. Your patients will appreciate your being honest with them and telling them the truth. If you were the only one who had failed it would be a different matter, but, you have lots of good company. Another very important thing I want to impress upon each of you is this: When patients of another dentist come to you and you make an X-ray examination and find the root-canal work faulty, do not condemn your brother dentist too harshly to the patient. Assure them that their former dentist probably did the best that could have been done under the circumstances, and that none of us have been able to do much better if we are to believe what we see in the X-ray pictures. Your brother dentist may not be as considerate of you in talking to your former patients, but it will leave a much better impression upon them if you always have a good word to say for your brother practitioner.

Since the dental profession has demonstrated conclusively to the medical profession that the teeth are really a great possible source of infection, and react upon the health of the individual in all manner of systemic conditions, many of our physicians have seized upon the teeth as the cause of every thing which they cannot trace to some real source. They have in many, many cases made themselves the laughing stock of thinking men when they pose as diagnosticians of any condition originating in the oral cavity. What do physicians know about the teeth? Absolutely nothing. I think any dentist could come nearer diagnosing a diseased appendix, which is entirely out of our sphere, but which we have as much right to do as the physician has to diagnose a condition about the oral cavity. I have had a number of instances where physicians have said to patients, "I have made a thorough examination of you and there isn't a thing wrong, so it must be your teeth." An examination of the teeth showed nothing wrong and mouth in good healthy condition. Or a physician may send a patient to you with instructions to have a certain tooth removed, and half the time there is no necessity of removing it. Our physicians must learn to refer the patient to us and leave it to us to say what should or should not be done with the teeth.

The word cooperation, like many other words of our present-day language, is somewhat over-worked, but it fits in just here. Cooperation between the medical and dental profession never was more important than today. The medical man needs the dentist and the dentist needs the medical man. They cannot work alone in this progressive age, if the best interests of our patients are to be at heart.

DR. WAIT: I want to take exception to Dr. Brown's statement here, from the standpoint that it might be a little discouraging, the fact that Dr. Harm's work is so much ahead of others. Now Dr. Harms is one of my best friends and is a good workman and thoroughly posted upon his work. I have looked at the work he has brought here, and I have looked at the work in his office, and I have studied it a great deal; many of you have brought work to me to be examined and I have seen work others have had that is just as good as Dr. Harm's work, and you can all do as good work when you have acquired the technic and made a study of it, practically as much as Dr. Harms has. Don't let that discourage you. The work is good, it is true, but you have done good work too, and I have seen it done for the last three or four years.

The Mayos, Dr. Brown says, are seeing a class of patients that we are not. Now Dr. Brown is mistaken. In my own experience I have seen the most of those patients from out our way, before the Mayos did. From your own experience most of you have seen these patients, and it is the fact that we dentists having seen these patients, that has sent them to the Mayos. Most of you remember my statement along this particular line here three years ago. But, nevertheless, at the time you or I saw the patients they probably were not in the condition they were when the Mayos saw them. And after having examined them, as the average dentist does not examine them, the Mayos do the radiograph work and then refer them back to the dentist or do the work there in their clinic which, as I understand it, has been increased some sixteen chairs in the past few months. But, in reality, we see these patients just as much as the Mayos do, and we see them at a time when a thorough examination would save them the trip to Rochester. I had a notice sent to me from one patient who came from Rochester. Dr. Smith, of Pawnee City, sent me some films that came from the Mayos from Rochester, where a lady who had been suffering from some serious nervous troubles, went there for an examination and they could find nothing organically wrong. The trouble seemed to come from the teeth. They X-rayed the teeth and sent her back with instructions to have five teeth out. When I went over their films there were five more that were just as bad and, I think, with a little more perfect X-ray work, every tooth, practically speaking, would have to be removed in the upper jaw and some in the lower. They didn't begin to get at the seat of her tooth trouble. Dr. McHenry, of Nelson, has some films that came from Rochester, Mayo's Institute there, that are a disgrace; it was a shame for an institution to send out a set of films like that. And I have seen them from others who have brought them in. I did not have the pleasure of hearing Dr. Gardner, of the Mayo Institute when he was here at the X-ray convention in April. I do not know what he said, but Dr. McHenry will bear me out in this statement. But, as Dr. Brown has said, Dr. Harms makes mistakes; they make mistakes; we all make mistakes. We have got to learn this: all can't pick it up and jump into it except by hard and long study; but, don't get discouraged and don't think that the other fellow is doing all the best work either; you can do as good work when you learn how.

I want to speak about the difference between your tissue changes there and particularly the pus pocket and the granuloma. Now there are lots of cases where you can do good treating, and other cases where you can do no good treating, because there are lots of cases of granuloma that are amenable to treatment; whereas, if it is a pus pocket you would get no results because the apical end of the root has been bathed in the pocket of pus so long that there is no good or healthy condition there without resection. If you can learn the difference between those two in your X-ray examination, you will get lots of good results and, probably, do many people a great deal of benefit; however, if you don't know the difference you will regret it and injure your patients. Dr. Harms has given us a nice study and he has helped us along a whole lot.

DR. MESERVEY: I would like to ask this question as to a number of radiographs of vital teeth, that came from the Mayo Brothers: Is it necessary to radiograph vital teeth?

DR. DAVIS: Dr. Harms will answer that in his closing discussion.

DR. WARREN: Like Mr. O'Brien, "I cannot keep my seat and see the money of the people wasted." I think we have come to the parting of the ways. Some of the old-fashioned fellows are still filling nerve canals, but we young fellows have to extract them. I don't think it is right to fill pulp canals, and I think if we cannot read these cases correctly we ought to send them to somebody who can, as somebody suggested here to me this afternoon. Now we ought to be able to read these perhaps, and those of us who have been practicing several years have been able to diagnose cases without the X-ray. The X-ray is a valuable adjunct but as the essayist said, and Dr. Despecher and Dr. Brown, also, we must be able to read them to a certain extent without that, for the X-ray is not the whole cheese; we should not rely upon that entirely. Another thing: We should show the M. D. where to get off in reference to this, the same as we have in a good many other places. They say to extract this tooth and extract that tooth. We shall not stand there like mechanics and do whatever they tell us to, not a bit, not by a damn sight. That is not the way to practice dentistry. We must have the last word in reference to the teeth. When it comes to the appendix it is all right but we know that there are men in Omaha here, Dr. Shearer, Dr. Harms and a lot more, who can read X-rays of the teeth better than the M. D's., and we must tell them what we think about it and cease extracting teeth unless that procedure conforms to our ideas.

DR. ALBRECHT: I wish Dr. Wait with his long experience would tell us something about how to tell which tooth is favorable for treating and which is not. Another thing, I would like to ask Dr. Harms if he finds it in his practice, where you see the bone in the granuloma, in the process of the bone, and curette out a typical granuloma. Many of those do not always show dark lines, and sometimes show a white line around this area and I would like to know the reason. Under clinical cases I have curetted out of these cases a typical granuloma.

DR. HARMS: I did not get that question.

DR. ALBRECHT: In the same area as your bone process, the process of the jaw, the granuloma, you still have your striations of bone. I have curetted a typical granuloma out of this area and I wonder why it is.

Dr. Truesdell: I have seen a few X-ray films of unerupted teeth. I have yet to see the first film of an unerupted tooth where there was not a line present between the bone covering the tooth and the enamel of the tooth. Now there may be times when part of the tooth is unerupted and part erupted, when it *may* become infected, and I think it may be possible for it to become infected, but I also believe that the pendulum of this extraction business is perhaps swinging a little bit too far. When to take out dead teeth and when not to take out dead teeth. I think age should control in large measure. What would be permissible, what would be practical and what should be done for a twelve or fourteen year old patient in my office, is entirely different from what should be done, or would be advised to be done, for a patient of forty or fifty years. In the first place the resistance is higher in the younger age, usually, and it seems to me that we should take these things into consideration. I am still a little bit slow as you may infer to believe that all dead should be extracted, at least at the time that they become dead teeth and I am going to put in a plea for these teeth, especially in younger people, where it is absolutely necessary that teeth must be devitalized, and plead that you go slow on the extraction because we have other conditions, pathologically, which may develop from the loss of dental organs. Some of you know, some of you may have guessed, that a large percentage of cancerous conditions and ulcers of the stomach are the direct result of inability to masticate. Now those conditions, from several that I have examined, have shown that the ulcerous condition has been manifested in the stomach in from about fifteen to eighteen years after the *efficiency* of mastication has been destroyed. Now if a person has grown to, say forty or fifty years of age then you can reasonably take a certain chance in destroying or impairing mastication. I wonder if we are taking the right course when we destroy the efficiency of mastication of a person in his teens or early twenties. I sometimes have grave doubt of that being the right course.

Dr. Davis: About three or four years ago I was berated on this floor because I would not treat loose teeth and pyorrhea in the mouth. They said, "What are we going to do—send them down to Lincoln and the dean there won't treat them; pulls them out. What can we do?" Well we extracted them, the same as we are doing today. Pyorrhea has one treatment. Hard tissues which have been bathed in pus for some time can never again be a part of a human being. It is made up of dead cells. If you study your histology and your pathology as you should, you know that *that* becomes a sequestrum, a foreign body. It must be either picked out by the forceps, or root resection; it will be the seat of infection as long as it remains, be it apical or cervical. Take that as a fundamental principle. If you have a pocket of pus from pyorrhea about the gingiva of a tooth there is just one treatment—to destroy the pocket. There are two ways: Extract the tooth, that is one way. The other way is to take a knife and bone curet and cut away from the tooth every part of the outside of the pocket. Oh, yes, it will look bad. Remove the incubator that surrounds the tooth and do it the first sitting. I was at Camp Gordon at the National Dental Teachers' meeting and saw a good many cases so treated. Now in reference to these apical troubles, I fully agree with Dr. Harms.

Dr. Harms (closing): In bringing this before you I did not intend to say anything about what should be done in this matter of treatment. What should be done as to this condition is another matter. My point was to try to show you what things meant, how to get the result on the film, rather than what to do with the conditions after you found them. Dr. Despcher spoke of one thing: He says he takes two exposures of the same case in the same position, with different results. That is all right. Heretofore, we have had a hard time to get exactly the same sort of a film at different times. It is due to the fact that our apparatus is not the same, and any one that uses a gas tube knows that the gas tube is never twice alike and all that sort of thing. But this is going to be overcome now that we have the auto control. By the auto control we can give the same amount of kilovolts and the same amount of milliamperes and, with the automatic timer, the same exposure can be made, so there is no reason why you should not take an exposure now and a year from now with the same sitting, and get exactly the same thing. The differences in the past have been the differences in the way the tubes work at different times.

That idea that often has been reported about physicians ordering the extracting of teeth and insisting that you remove everything and a whole lot that should not be removed has not been my experience. I have yet to run across any physician who would not leave it to me to say whether those teeth should, or should not be extracted. In defense of the medical profession, I will say; I don't think that you are going to have very much trouble with them providing, of course, that you can show them that you know your business and the main thing is to understand what you are talking about in your field of work. They are not as radical as we are often led to believe.

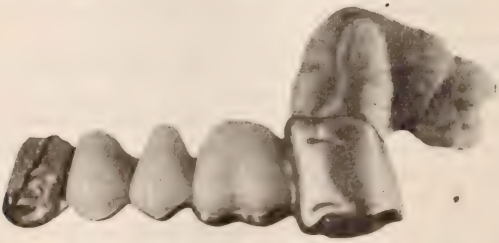
Now as to the extraction of teeth in rarefied areas—if the rarefied area is due to an infection probably you should remove the tooth. There is no such a thing as saying that this or that is going to cure something. The teeth, you must remember, are only one source of infection and it is only by looking at other things that you can determine whether you are going to get the result. It often has been said that this or that man has carried those teeth with all those things in there for years and years and has not felt anything in the way of trouble or infection, and that he is seemingly in good health, but I venture to say that if he should undergo a thorough examination a good physician would locate some trouble, somewhere, that he did not admit he felt or that he did not know about. And, putting it the other way around, when we wait until a man has some systemic disturbance which causes him to look after his teeth, and that calls attention to the teeth, why not call the attention to the general health first when you do find teeth that may cause some general disturbance? The X-ray diagnosis should be made only so far as what to do is concerned from a health standpoint. When we order the destruction of teeth we do it with the idea of health and not from any other standpoint. The rule is always to remove infection, no matter where it is, or what it costs. Infection must be removed. Some remarks have been made about the Mayo clinic. Now there is one thing about the Mayo clinic and that is this: At the present time it is doing more for dentistry than any other institution in the world, and in spite of the fact that they are not sending out radiograms which are as good as you probably see somewhere else, or that you do yourself, you must also take into consideration the difficulties under which they are working. It is less than a year ago that they have started this dental department at the Mayo clinic, and Dr. Gardner who is in charge of the clinic, had to build up an organization from nothing. When he took charge there was not a dentist on the staff who could help him. He was expected, and is expected, to examine from 150 to 200 patients every forenoon. He has to train operators to operate his X-ray machines, to develop and to mount them, besides he has to take care of, with the assistance of two or three men, and examine anywhere from 100 to 200 people every forenoon between eight and one o'clock, and that is an awful lot of things to do besides trying to find out where the trouble is up in the X-ray department and why you don't get better looking work. But that is all going to come. The plan is to take in students, train them for a year at a small salary; if they make good give them a paying position and, in that way, build up a staff in that institution which will be a credit, not only to the institution, but to the profession as well. So, if you will only give them time it will all be worked out. There is this about the extracting part of it up there: As far as doing that they are doing very little extracting. Their idea is to cooperate with the whole profession, and you are probably getting in your office some advice from them from patients in your home town and their advice as to what to do. And let me say this: While you may not agree always with their findings they are trying to cooperate with you with the patient's health in view. The examination of the mouth there is a routine examination. It is the same as the blood count and the other things; they put things all together in the final analysis and decide on what should be done. In a place like this where we are working separately we are not always cooperating with the men who are doing the work and taking the rest of the examination. In other words cooperation is not close enough and it is only by close cooperation that we can get results. We claim that the teeth are but one source of infection as has been said. Of course the Mayo clinic is being watched and the results they turn out comes from an immense amount of labor, but, I assure you, it is being taken care of as fast as it is possible to do so.

Dr. Meservey's question, as I take it, "Is it necessary to radiograph vital teeth?" I do not believe, gentlemen, that a diagnosis or X-ray examination of the mouth is complete unless every tooth is taken in and every region is radiographed. Now, I will admit that you probably don't find trouble with vital teeth, but, especially if the patient has nervous symptoms or anything of that sort, you are overlooking infected teeth, you are overlooking supernumerary teeth, and the conditions which those things cause and, while it may not be necessary theoretically or practically to X-ray vital teeth, you are overlooking something when you do not examine the whole mouth. In regard to the granuloma—it depends upon the density of your tissue. For instance, broadly speaking, if the jaw is this thick and the granuloma takes in a big round area like this (illustrating) you probably would not see any striations in this region. But if the jaw is this thick and the granuloma thin like that paper you would probably, by a good film and a lot of detail, see the striations due to the different density of the tissues. In answer to the remark of Dr. Truesdale about going on and extracting teeth in children due to the fact that we have harmful results due to the extracting, I wish to say that in my estimation, the result of retaining infection in the mouth of a child of any age is worse than the results of malocclusion.

AN IMPACTED AND FUSED THIRD MOLAR

BY W. C. KERNS, D.D.S., PIQUA, OHIO

Case Report: Lady about 48; upon presentation all upper teeth were found to be very loose, including those used as abutments for the bridge shown, left upper cuspid and second molar. I split the crown attached to the cuspid, and then attempted to extract second molar, the other abutment. While very loose and playing about, it resisted attempts at removal, seeming to cling to something. Removing the forceps, I noticed that her gum was being lacerated. Dissecting away the gum, I discovered the impacted third molar, which was completely embedded and concealed. There was nothing whatever to suggest the presence of a tooth back of the second molar to which the bridge was attached, so that I had not suspected its presence.



Upon extraction by surgical means it was discovered that the impacted tooth was completely fused between the roots of the molar immediately in front of it.

The presence of the impacted tooth had caused no particular trouble to the patient, although pyorrhea had attacked and practically destroyed the entire natural denture.

MACROCHEILIA*

BY FREDERICK B. MOOREHEAD, M.S., M.D., AND
KAETHE W. DEWEY, M.D., CHICAGO, ILLINOIS

MACROCHEILIA, or enlargement of the lip, is essentially a hypertrophy or hyperplasia, involving chiefly the lymph vessels. It is therefore generally classed among the lymphangiomas. Very brief and very few are the statements found in textbooks on pathology concerning this abnormal condition of the lips, and little space is generally given it in clinical reports and in journalistic literature dealing with lymphangiomas. It is chiefly since Wegner's[1] investigations on the subject that it has become customary to consider this condition as a lymphangioma or a lymphangiectasis. Slyus[2] calls it a lymphangiomatosis. The blood vessels, however, may be as much involved as the lymph vessels. Occasionally, the blood vessels alone are abnormally developed. One of the most remarkable cases of macrocheilia on record is one of a hemangiomatous macrocheilia, reported by Sonntag.[3] It was associated with a hemangiomatous macroglossia. Cases have also been observed in which the proliferation involved chiefly the connective tissue. An entirely different and rare type of macrocheilia is represented by a few cases in which the enlargement was due to an abnormal development of the mucous glands of the lips. According to Fraenkel,[4] they are either due to purely inflammatory processes, or are genuine, that is, congenital, abnormalities.

Macrocheilia is a purely clinical conception, as Eichler[5] states, who defines the malformation as a persisting condition of a uniform swelling, equal in all dimensions. The lip appears twice, thrice and even six times as large as normal. The essential form is, in general, retained, but it is peculiarly clumsy and entirely out of proportion to the other parts of the face. The abnormality has been so marked in some cases that such a mouth has been compared to a snout or a trunk. A circumscribed lymphangiomatous enlargement of the lip is therefore not to be called macrocheilia, nor does any temporary swelling resulting from inflammatory processes belong to this group of malformation. A few cases, however, have been observed in which a true macrocheilia, that is, a persisting uniform enlargement of the lip, developed as a sequel of recurrence of erysipelas.

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*Read June, 1919, before the Section on Stomatology, A. M. A., of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement.

[1] Wegner, G.: Ueber Lymphangiome, Verhandl, deutch. Gesellsch. f .Chir. 5:256, 1876.

[2] Sluys, F.: Ein Fall von Makrocheil, Strahlentherapie, Orig. 5:241, 1914.

[3] Eichler, M.: Zwei Falle von congenitaler Macrocheilie der Unterlippe und Zunge, sowie dessen Behandlung, Arch. f. klin, Chir. 104: 972, 1914.

[4] Fraenkel, E.: Ueber einen Fall von Makrocheilie durch Adenome der Lippenschleimdrusen, Arch. f. klin. Chir. 44: 95, 1892.

[5] Eichler, M.: Zwei Falle von congenitaler Macrocheilie der Unterlippe, Bonn, 1883.

DEVELOPMENT OF MACROCHEILIA

Macrocheilia is generally congenital; but it may also be acquired. The collective name of lymphangioma, applied to the condition to which this malformation is accredited, includes a large variety of forms, which are difficult to separate into well-defined groups. But the congenital form of macrocheilia, together with several similar congenital lymph angiomatous or hemangionmatous hypertrophies of the face and neck, constitutes a fairly well characterized group, namely, that of the tongue (macroglossia), the cheek (macromelia), the skin (nevus lymphaticus) and the palate and the neck (hygroma colli et cervicis congenitum). In the congenital form, the malformation may be present at birth; in these cases the same disproportion of the size of the lip to the rest of the face remains as the child grows. Or there may be a mere suggestion of the malformation in the new-born child, and the disproportionate development occurs later. This is sometimes observed in association with recurrences of inflammatory processes, especially in erysipelas. Generally, the condition appears soon after birth or in earliest childhood. Instances in which it developed late in life are rare; in a case reported by Sonntag, the patient was 47 years old; Sluys reported macrocheilia in a woman, aged 54.

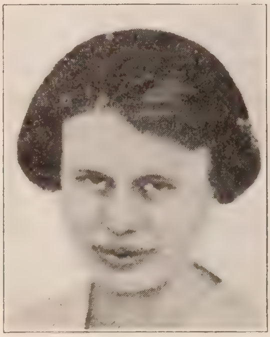

Fig. 1

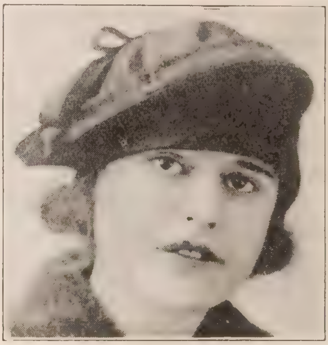

Fig. 2

Fig. 1.—Appearance of patient before operation.
Fig. 2.—Patient after operation.

In women, the condition is apt to arise at the beginning of menstruation, during pregnancy or at the menopause. The development is rarely acute; generally it is slow, and in some instances interrupted by long intervals. In the cases in which the macrocheilia appeared late in life, the condition developed suddenly. One lip or both may be involved; macroglossia may be associated with it. In a few cases, alterations in the form of the jaw have been observed; the teeth are also sometimes involved. A remarkable case was one reported by Sonntag in 1914,[3] which occurred in a man, aged 47. The lower lip and the tongue were enlarged to such a degree that the patient was unable to bite or chew, or to keep the tongue within the mouth except by holding it back with the hand. The tumor was a hemangioma; by pressing down on the tongue or stroking backward, the size could be reduced almost to normal. This may be done with some lymphangiomas also—by pressure, the tumor may be greatly reduced. When the pressure is released, there is a return to the former size. The enormous amount of blood thus indicated greatly complicated the operation reported by Sonntag, which, however, was accomplished, giving satisfactory results.

TREATMENT WITH RADIUM

Successful treatment with radium was reported in 1914, by Sluys.[2] The patient was a woman, aged 54. The tumor was very large, of even consistency, and not producing any pain. Ten days after the first treatment the tumor had completely disappeared. Sluys employed the gamma rays—which penetrate the deeper structure, leaving the outer tissues unaffected—with the result that no pigmentation occurred and a fairly well-developed mustache, which the woman possessed, remained intact.

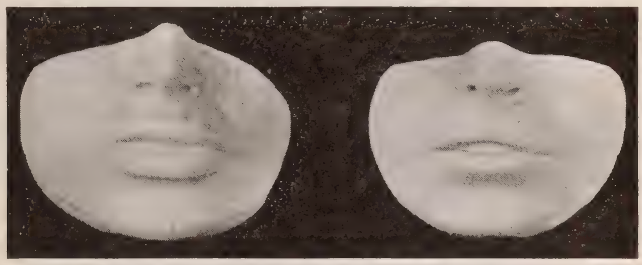

Fig. 3.—Plaster cast before and after treatment.

The abnormal growth in macrocheilia involves chiefly the corium and the subcutaneous tissue. The main feature is dilatation of the lymph vessels. A new formation of vessels is not always demonstrable; the condition is more often one of lymphangiectasis. If the process progresses, the ectasis may develop into a cavernous lymphangioma. The connective tissue, which frequently proliferates simultaneously, is generally rich in lymphocytes and may contain elastic fibers and smooth muscle fibers. Not infrequently, the blood vessels are also abnormally developed. Sometimes blood is found in spaces which are clearly lymph spaces. This observation is explained by the fact that the blood vessels and lymph vessels are often very close together; the former sometimes actually seem to lie within the latter; the slightest injury may therefore lead to an exchange of the contents between lymph and blood vessels.

ETIOLOGY

As to the eitology of macrocheilia, several theories have been advanced, but a satisfactory and generallly accepted explanation has not yet been given. Virchow's view is that the condition is due to some disturbance in the development of the branchial arches. This may be true in some instances; Eichler[5] believes that in one of his cases there were evidences of such an origin. Nevertheless, we are still entirely ignorant as to the influence which produces the disturbance. Samter[6] expresses the view that probably all congenital lymphangiomas, including those which develop at an early period of life, have an embryonic origin, which consists in the development of lymphoglandular tissue. They occur in the regions in which dermoids are found. Stasis of the lymph is to be considered as the immediate cause of the lymphangiectasis in macrocheilia; this has been explained as being due to obliteration of the lymph vessels in the deeper layers of the skin by proliferation of the endothelium, or, according to Rindfleisch,[7] to hyperplasia of the muscle fibers, impeding the lymph circulation. Wegner, in his classical work on lymphangiomas, discusses three ways in which the stasis of the lymph may be brought about: *First,* there may be occlusion of the regional, efferent lymph vessels, which may be produced either by a primary fault in the development (vitium prima formationis) or by thrombosis, or by compression and misplacement resulting from local processes of inflammation and scar formation. *Secondly,* there may be an active proliferation of the endothelium of the lymph vessels, in the course of which solid cell masses are formed. Between these endothelial cell accumulations, hollow spaces develop which, by opening into preexisting lymph vessels, become real, new lymph vessels. This constitutes a homeoplastic neoplasia. A probable third mode is that granulation tissue develops in a connective tissue matrix, and, indirectly, by secondary transformation of this tissue, new spaces containing lymph are formed. This is a heteroplostic neoplasia. Wegner is of the opinion that in the congenital form of macrocheilia, the stasis appears during the fetal period of life, the disturbance occurring in a region involving the lymph vessels; possibly the efferent lymph vessels are occluded because they are primarily not sufficiently developed. According to Borst,[8] there may be at an embryonic period of development an excessive formation of lymph vessels, perhaps associated with a faulty connection between these and the rest of the lymph system, with the result of stasis and ectasis.

Microscopic examination of the tissue removed from a patient with macrocheilia revealed that the abnormal development involves the blood vessels to the same degree as the lymph vessels. Evidently, they are for the most part dilated capillaries, having only an endothelial wall. The blood vessles often have constrictions and ampulla-like dilatations; they are curved, or form cavernous sinuses. The lymph vessels and spaces surpass the blood vessels in size; they are very irregular in form, and many of them have, like the blood vessels, a cavernous appearance. Two or three may communicate with one another. They are lined with a continuous endothelial layer; sometimes the cells are separated; more rarely, spaces are found which have no cells. This separation of endothelial cells and the more infrequent absence of cells are, of course, the result of the lymph stasis. By the increasing pressure, the thin wall is stretched, and the cells lie farther apart; they are flattened out and finally may disappear entirely.

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[6] Samter, E. O.: Ueber Lymphangiome der Mundhohle, Arch. f. klin. Chir. (Langenbeck's) 41 : 829, 1891.

[7] Rindfleisch, E.: Lehrbuch der pathologischen Gewebelehre, Bonn, 1871.

[8] Borst, M.: Pathologische Anatomie (L. Aschoff), Jena, 1913, 1 : 695.

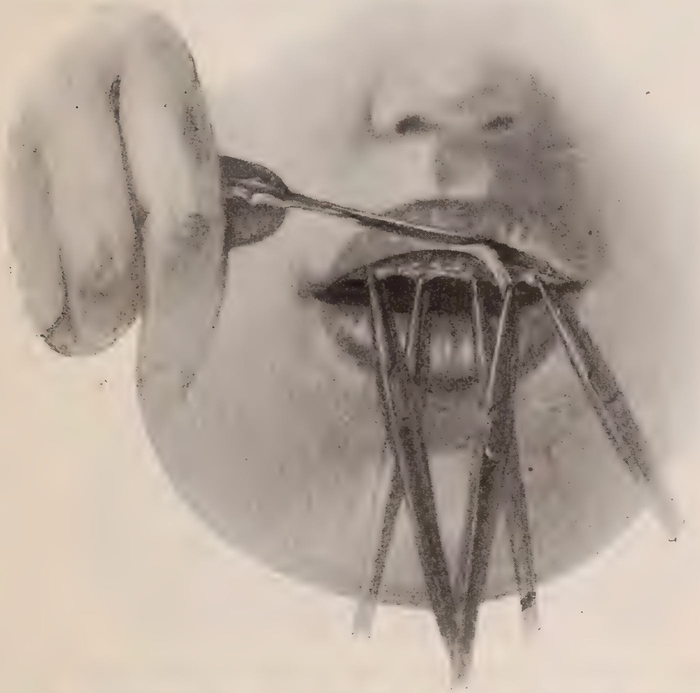

Fig. 4.—Method of opening lip for dissection of excessive lymph tissue.

The hemolymphangioma involves chiefly the corium and the subcutaneous tissue. There are also dilated blood and lymph capillaries between the muscle fibers in the deeper layer of the tissue. There is not a marked general proliferation of the endothelial cells; but interesting and noteworthy are the papillary cell proliferations extending from the wall into the lumen of the lymph vessels. Five of six such intravascular papillæ are present in almost every section. These cell collections appear either as small elevations, closely adherent to the inner wall, in the form of darts or nodules, or as larger, globular or berry-like masses, which become pedunculated and finally are entirely detached. They consist of proliferated endothelial cells and small round cells; flat endothelial cells are sometimes found at the periphery, forming a sort of outer lining.

As the process goes on, the proliferating cells assume larger forms; sometimes fusion of the protoplasm of several cells takes place. In the largest villi, regressive changes have set in; the protoplasm is disintegrated, and the nuclei have disappeared. These changes are always most marked in that portion which is nearest the vessel wall, while toward the lumen the cells are well preserved. Sometimes cell proliferations extend like bridges from one side of the wall to the opposite one. These papillæ occur only in lymph vessles. They are not trombi; polymorphonuclear leukocytes are absent in them. The larger number of lymph vessels and lymph spaces are empty; in others there are masses of coagulated material, which is precipitated lymph. Sometimes, a finely granular, yellowish brown pigment is found within coagulated masses along the inner border of the vessel wall, sometimes also just outside the wall; there is no evidence that it is derived from the blood. These precipitated masses are the result of the stasis of the lymph. Wegner described them first and called them lymphthrombi; he observed all forms of transitions in the regressive changes. Cellular lymphthrombi, however, which he mentions, are not present in our sections; only rarely a polymorphonuclear leukocyte or a red cell is engulfed in the precipitated mass. Occasionally, an entire small vessel, content and wall, is converted into one mass, resembling huge giant-cells; in some of them the nuclei of

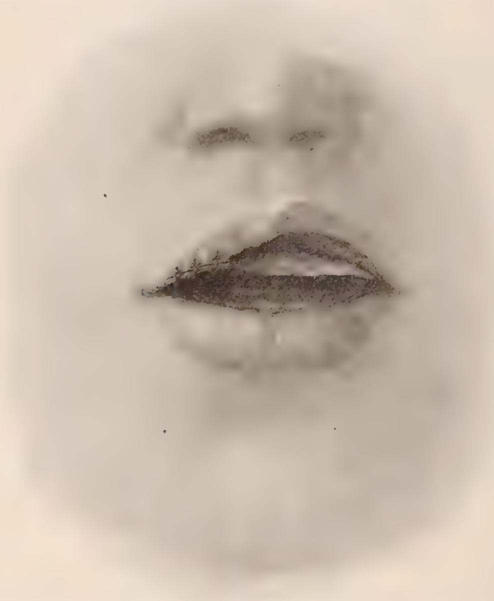

Fig. 5.—Completed dissection and method of closing wound with horsehair suture.

the proliferated endothelial cells have remained at the periphery, in others they are grouped eccentrically or lie in the center.

The blood vessels are, outside the normally existing arteries and veins, dilated capillaries, the walls of which are as thin as those of the dilated lymph vessels. They are recognized by the presence of blood. Sometimes, a few blood corpuscles also are found in lymph vessels. Their presence is easily explained. Lymph vessels and blood vessels lie close together; the later seem sometimes to invade the former. Communication between blood and lymph vessels is not unusual in lymphangiomas.

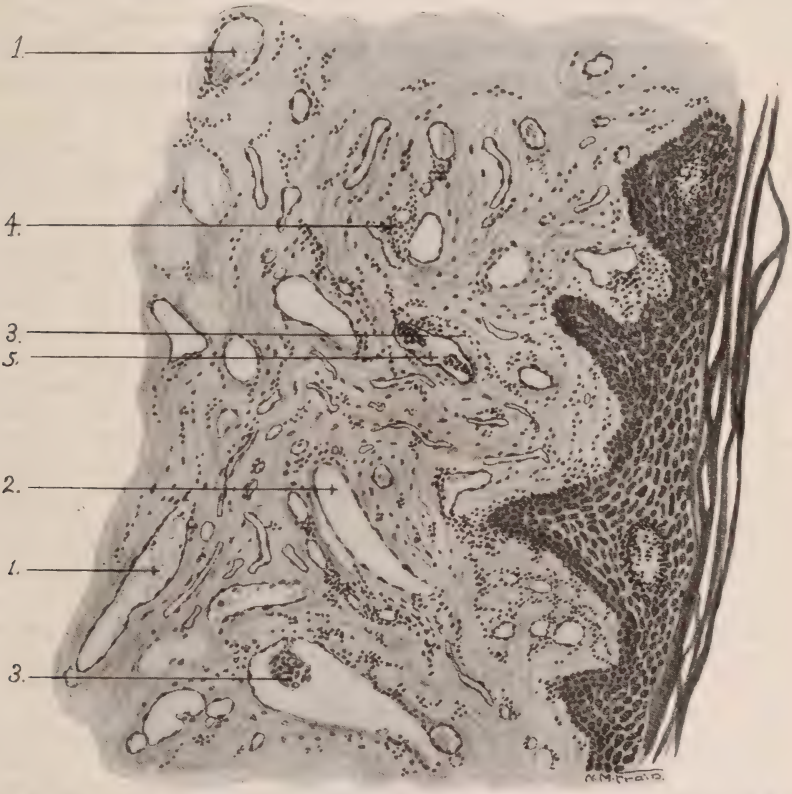

Fig. 6—Microscopic preparation of the lymphangiectatic tissue removed from the patient. 1, blood vessels; 2, lymph vessels; 3, papillary proliferation of endothelial cells; 4, small round-cell infiltration; 5, coagulated lymph.

Through pressure from the continued stasis, the thin wall may be so overdistended as to yield at one point or another to the higher pressure from an adjoining blood vessel, and blood then passes into the eroded lymph vessel. Trombi may form at these places, which close the opening; but in the course of regressive changes they may be canalized again. When several vessels communicate, there is generally proliferation of the endothelial cells at the place of confluence.

There is only a moderate degree of proliferation of the connective tissue, while there is a noteworthy increase of smooth muscle fibers, Infiltration with small round cells is present, more or less, throughout the corium. They collect especially around the vessels. There are regions in which the lymphangiectasis is in the background; here the tissue consists largely of lymphocytes and innumerable minute vessels. Here and there denser collections of lymphocytes are seen, which resemble lymph follicles. There are areas of small and large hemorrhages in all stages of regressive changes.

In the case of macrocheilia shown in *Fig. 1*, there was a cavernous hemolymphangioma, which was probably of a congenital origin. The abnormal development did not consist of an angiectasis only, but obviously a new formation of blood and lymph capillaries had also taken place. An interesting feature was the papilla-like intravascular proliferations of the endothelial cells. Indications that they might be sprouts which develop into new lymph capillaries were lacking. A perceptible lumen was nowhere found. The regressive changes which they undergo also speak against such a supposition.[9]

[9] In addition to the references already given, the following will be found of interest:

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OPERATIVE TECHNIC

The operation for correcting macrocheilia is not difficult. Unless, however, it is intelligently performed, deformity may result. The lips are clamped with a lip-clamp to prevent hemorrhage, which is profuse. The mucous membrane is opened by two parallel incisions the entire length of the lip, and a small section of tissue is removed. By careful dissection, the excessive lymph tissue is removed until the lip has been reduced to normal. The wound is closed with a figure eight horsehair suture, the first loop closing the deep structures and obliterating dead spaces, and the second loop closing the mucosa. If horsehair is used in this fashion, buried sutures are not necessary, and scar formation is reduced to a minimum.

DISCUSSION

DR. VILRAY P. BLAIR, St. Louis: Too often talks on the result of surgery of the face are merely descriptive of technic, and the result is sometimes not what you want. The question of this lymph enlargement is one of the most difficult things we have to deal with in surgery. I have always been held down a little bit possibly, by the fetish of Butlin, that if you burn these things or irritate them, you possibly may get some reaction toward sarcomatous formation. I cannot say that I have ever seen it, but I have always thought it deserved some attention. I have tried radium. Other people have found it a success, but I have not had very good results. The way we have handled them is to pick out blocks of tissues where it could be done with the least possible deformity resulting. The whole thing appeals to me as one of the meanest conditions in surgery, unless you can take it out as a whole.

DR. M. I. SHAMBERG, New York: The paper of Dr. Moorehead is interesting, and the most important part of the paper to my mind is the fact that he called attention to the differentiation between the two cases of macrocheilia and those cases where there is a localized hemangioma or hematoma within the lip, or other types of inflammatory disturbances of a transient character. So often, as the result of injury, the lip may swell temporarily with the absorption of the inflammatory products, or the blood which may have extravasated into the tissue. I have had a number of lip cases within the past ten or twelve years that were intensively interesting. One was in a member of my own family, an infant born with a large hematoma of the lip. This was readily removed with a very nice result. The great tendency is to remove insufficiently the amount of the growth in these cases of hemangioma. In the case of lymphangioma the growth is more nearly uniform, and the lip is enlarged throughout. It is important to differentiate between those cases in which there is a localized growth within the lip, those which are distinctly inflammatory or transient, and those in which there is a true hypertrophy. There is one other type of lip condition that sometimes resembles a macrocheilia and that is the so-called double lip, or what I prefer to call prolapse of the lip, which is much like the prolapse of the anus. These cases can be handled in very much the same way. I am fully in accord with the view that it is necessary during the operation to be sure that you have removed sufficient of the lip by approximating the edges, and that the best results are not seen within a week or two after the operation. It takes a little time for the lip to reestablish the disturbed circulation, and to cause absorption of the edges of the wound which are rather stiff as the result of the operation.

DR. THOMAS L. GILMER, Chicago: It seems to me that the term macrocheilia is not the best name for the conditions described. It means simply an enlarged lip, and since we have so many different conditions which cause enlarged lips, we should be more specific in differentiation. I have had better success in the treatment of enlarged lips due to prolapse of the mucosa than in cases of lymphangioma of the lips. I have had but one case of the latter, and in this, the success was not as good as I had hoped for. I dissected out the enlarged lymphatics in the lip as thoroughly as it seemed desirable, even making the lip smaller than it should be, but in the course of a few months, the lip was enlarging again. I have had the same fears as expressed by Butlin and also by Dr. Blair today of the possibility that changes to malignacy may result from surgical interference.

DR. FREDERICK B. MOOREHEAD, Chicago: Dr. Blair has raised the question of malignancy, and it is interesting to note that a careful review of the literature does not reveal a single case of malignancy in connection with the lesion under discussion. The use of radium in these cases is more or less experimental as it is elsewhere. I have not had enough experience in the use of radium to make any definite statement about its application.

"FELLOWSHIP"*

BY W. E. R. GURNCY, FREMONT, NEBRASKA

MANY YEARS AGO, out in the pioneer country of western Kansas, there lived neighbor to me a boy, a pally fellow named Tony Martin.

Now Tony was green—green in the sense of being raw material, green in experience, green in the ways of the world; life to him was real only in day dreams, and large only in ambitions.

Tony lived and grew as boys will live and grow. Perhaps he grew mentally in that unattractive environment of buffalo grass and cactus below and sky above, with a horizon melting away on all sides into the monotony of nothingness. A stranger stepped off the train one day and said to a Kansas boy, "Does the wind blow this way all of the time?"

"No," was the boy's reply, "Part of the time it blows the other way."

Those were rather dreary years. The winds blew and blew, the heat rolled up from the scorched plains to the southward and the rains forgot to fall. In the fall we could harvest our corn with a buckboard, the ponies traveling on high. We primed the hayrake with an armload of straw as a kind of teaser to induce the scattered blades of grass to stick. We antedated Hoover by thirty-five years in the matter of food restrictions, barring only corn meal and sorghum; and any rules of the fuel administration were a superfluity to a community whose prized combustible was the buffalo chip.

Now I mention all this because I wish you to know some of the influences that went into the making of the thought processes of Tony Martin. He used to talk with me about the great injustices of life. Those were the days of populism, out of which later evolved, "Sockless Jerry" Simpson and "Bewhiskered" Peffer. It is a curious fact that none of us are inclined to place the real blame for our afflictions where it belongs. If we ride out and get stuck in the mud, or the machine balks because its carburetor and differential and diaphragm are not functioning properly, we lose our temper and shower our cuss words on the wife and kids who are along and who innocently offer a word of counsel or advice. If we lose our crop, for the simple lack of rain water, we blame it all on to prohibition, or a protective tariff, or the league of nations, or something of that kind.

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*An address at the banquet, Nebraska State Dental Society, May, 1919.

So Tony Martin blamed society—knew that the world was all wrong, and imagined that out in its environs were a dense populace of Ishmaelites, each of whom had his hand raised against every other man. The clouds on the horizon looked black to him, and the years ahead seemed a struggle in a world where "man's inhumanity to man, makes all the nations mourn."

At this particular moment when mental astigmatism threatened, Tony moved. Some influence, let us say good judgment, though it may have been only the kindness of Fate, brought him here to Nebraska. Here he still lives, in God's country, where nature dresses herself in prodigal green in the spring time, and the brownness of autumn comes only as a fulfillment in harvest; a land where every prospect pleases, where there are horses and kine more abundant than Jacob ever dreamed of, and over whose thousand hills there graze great flocks and herds; a land of gardens and farms, of orchards and homes, of cities and towns, of citizenship superb.

At a little later date I came back here to Nebraska and have lived here all these years, so I have had an opportunity to keep up my acquaintance with Tony, and he has discussed frequently these matters with me just as we used to do in the old days of the Grange. And, as conditions have been somewhat revolutionized, so has there been an evolution in the mental attitude of my friend who is now Doctor Tony Martin.

At the outset, Tony was not free to give up his coin; the training of the old days in the southwest where dollars were rare visitors, persisted. And, agrarian trend as he was, he carried the assumption that the other fellow to whom he paid a dollar kept it. It looked to him like everything was "beer and skittles" to the other man. To his youthful mind the man in the candy store was a most happy mortal, doing nothing the live long day but to take in the coin. The merchant of whom Tony bought his shoes must be a leech, coining money out of the necessities of his customers. The shop keeper in general was a necessary evil, a kind of parastic growth of which a newer arrangement of society should divest itself; while a professional man was a profiteer. And I have no doubt, that if Tony, like some other unfortunates called upon the dentist, his physical writhings under drill and forceps, and mallet and chisel, all feebly relieved by conversational monologue, these writhings were as nothing compared to those later twists of torture in contemplation of the bill.

Tony traveled a bit and saw some of the evidences of wealth. He gazed upon mansions and made mental inventory of the happiness of the rich on a basis of their outward splendor. He looked in at great edifices in the march of commerce, buildings with columns of granite and appointments of bronze and he looked upon these things as so much wrung from the helpless hands of toil.

But along with these observations, some different ideas began to arise within his consciousness. One day in a financial flurry the candy man and the shoemaker both went broke. Shortly after the man in the mansion sought the bankruptcy court in the same way, while a proceeding in another court indicated that the happiness which Tony had imagined inside the splendid home had not existed. He found that even the dentist, the man who rolled in wealth and who got all the money anyone could crave by simply putting it in the bill, had a mortgage on his home, and one day his eye caught on the dentist's desk a suspicious looking notice in red, from the bank, suggesting the filling of a cavity by deposits, an extraction of notes, and some bridge work in the matter of balances.

"So," said Tony to me, "that dentist can't have such an easy graft after all. And by the way, I have just gotten an idea into my head that I was the fellow who made the money out of the transaction. I had the work done as a matter of adding to my personal comfort only, but it is a fact that by reason of my better physical condition, I made a couple thousand dollars more last year than I could ever have made otherwise."

One day Tony went to the funeral of a certain rich manufacturer who had been called hence. He sat and heard the recital of the life of the departed; how the man had built great buildings, employed hundreds of laborers, paid out millions in pay rolls, developed lieutenants and superintendents, and had added immeasurably to the wealth of the community, and then, as he helped carry all that was mortal to the little six-foot resting place in the cemetery, he could not but reflect on how little the dead man had, how much society had benefited.

He examined into his own affairs. He found that out of every one hundred dollars received he paid out ninety-five to labor directly or indirectly. Since his net wealth at that time was $5,000.00 he perceived that in the process of this accumulation during the years he must have paid out to others at least $95,000.00. Then he began to take account of his neighbors and saw their works. There were farmers and bankers, lawyers and laymen, mechanics and artists; and he saw them now builders, not brigands; makers of money which they could never take hence. He began to see each one a producer, usually of a little wealth for himself and always of a great deal of wealth for other people. And thereafter, when one of his fellow citizens was called by death, he mourned with the bereaved, but more, he thought of the loss to the community. He said to me one day, "I find myself in awe when I think of the *value* of a *man*. I have seen wealth in forests, I have gazed upon fertile valleys, I have read of the mines of Golconda; I have, in a mad struggle for wealth, bought oil stocks, having visions of being smothered in oil, a fate as unlikely of fulfillment but as pleasurable to contemplate as that of the old toper of being drowned in a sea of gin; but I never realized until lately that in the thousands of fellow citizens of my town we have a wealth-producing factor eclipsing all these fabled sources. The raggedest urchin that roams the streets, coming on to unsuccess, is worth something; if he achieved large success he may be a producer of a hundred millions of wealth.

But now, another fact began to dawn upon Doctor Tony. It was with reference to his preconceived notion about his competitors. Some times, in my exasperation I have said that doctors are the d----est fools that ever lived anyway. I do not mean, you understand, doctors of dentistry, nor doctors of divinity, or horse or anything of that kind, but just plain old fashioned M.D.'s. Nor do I refer with particularity to their investments in things—in oil stocks, and rubber stocks, and mountain canaries, and messes of potash; all these too frequently interest my friend of the old school; but I am thinking more directly of that sanguinary streak of jealousy in a practitioner which makes him get along so abominably with his competitor in the profession.

Doctor Tony Martin had this notion deeply implanted in his makeup; he had come from Kansas where he saw hard days, with poor crops, and where, with little to spare, the one who grabbed first got most. So he thought this a little world with only so many patients in it, and he could not get over the idea that what his competitor collected in fees was just that much out of Dr. Tony's pocket. I think, too, that he was more concerned professionally than as to the dollars involved. If Dr. Jimmy attended the family of Mr. Smith, and the children managed to get well it seemed almost a slap at Dr. Tony's reputation, though, as a matter of probabilities, the youngsters would have recovered from their measly attack in spite of the services of even both these able practitioners. So Dr. Tony said little cutting things about Dr. Jimmy; and Dr. Jimmy retorted in kind; both remarks being to the effect that the other fellow was a natural nut, poorly shelled at that; and the public, hearing these things, believed there was probably some truth in what each was saying of the other. Every time we say a mean thing about our competitor, there is a recoil, and the kick back hurts just as much as the front end does, sometimes more. No man has achieved a place in his profession until he has come to respect the good in his competitor. As a matter of fact competition, especially if it ultimately evolved into fellowship, is the most helpful influence in our lives.

Competition is a grindstone, grinding the noses of fools, but sharpening the wits of men of sense. It breaks dry putty into dust, but it puts an edge on the steel of capacity. It is a tumbrel into which we are thrown, coarse and scragily and imperfect, out of which we come, polished and more nearly perfect than could have been dreamed of before.

So, Dr. Tony lived and wrought; his toil continuous, his one phantom of fear the other doctor up the street. One day I caught Tony with a few quiet moments and I tried to tell him of a case. I said, "Doctor, do you remember the little old one-cylindered town out on the Solomon where we used to trade? There was just the one storekeeper, a simple old man, his brow puckered with the cares of the community. He need not have worried so, for there were many others who ranged themselves nightly around the stove, spitfully discussing grave matters of neighborhood, or even international concern. There was the old stove, in a setting of gravel spitbox, into whose sands the missile sometimes landed. On the shelves were the fly-specked calico, the tousled yarns, the candy jar, all innocent of sanitation or sich, while in the rear, in happy and hopeless confusion, were mixed the butter and the kerosene. Adam Bede tells of his early-day boarding house where they kept the milk in open crocks, in the one room where the folks ate and slept, and smoked and sweated, and he says that when he ate his buttered bread he could taste every member of the family. And so lived on this ancient store man, happily, but for one-ever present specter—this the fear that someone else would start a store across the way.

"Did the old man get rich? No; his Dun rating was M—. He always has had things his one way; perhaps he should have hauled up at the terminal Success, but he did not. When he cashed in they had a funeral with an occasional sniffle, when the choir sang, "Rock of Ages," a really first-class hymn because the tenor outsang the basso and the soprano rivalled the organist in out-put and the alto sang also. It was, honestly, not a solemn occasion, except as there is solemnity in the ceremony of burning the mortgage. The old man had been but an encumbrance, now happily released.

"Now, why was this thus? Was old man Grimes not of good moral and mental caliber? Did he not, like Shylock, have the same arms, the same eyes, the same sensibilities as other men? He had! Then what did he lack? And I answer, 'He needed what he all his life had feared—a competitor.'

"A good angel would have brought him the fearsome thing he had dreaded so long, and then, the shell broken, he might have shed the down of chickenhood and put on the vesture of manhood, or the armor of the plumed knight. No man ever achieved greatness at the crossroads. No sailor e'er grew strong upon a sleeping sea; it is only when we meet difficulties, and grapple with other men, that we grow in greatness and in strength."

The doctor sat awhile, studying, and said, "It's all right the way you put it; I know that I ought to get along with him, and I would with most anyone else; but my competitor is a son of a gun! He isn't half white, he isn't company for man or beast! Just last week he said so and so about me, and I can prove it!"

I could only retort, "Well Tony, you know the recipe for having neighbors, don't you? Just two words, 'Be one'."

One day the doctor came to me looking a bit shame-faced. He went on to tell how he had gotten a call to go five miles up the valley. The weather was wretched, a mixture of snow and rain such as we sometimes have in late March was falling, but there came to his subconscious mind the vision of Dr. Jimmy making the call if he did not, and thereby springing into some very valued practice. So he put on the chains and started. About four miles out, the car plunged into a soft spot and stopped. He put her in low, with all power, and made scarcely an inch forward. Then he tried reverse, and the wheels only dug themselves deeper into the mud. He got out to survey the situation and found he was stuck for fair—the car lay sunken to the running boards. The snow struck him in the face, and melted icy cold upon his clothes and his numbed hands. Then a man came along, with a team hitched to a buggy, and stopped to sympathize. This party was one of the wealthy whose practice the doctor so desired, but he finally said, "Sorry, Doc, that I haven't got a rope and doubletree to give you a pull, but as it is, I guess there isn't any thing for it but for you to walk back to town," and he drove on. A few minutes after, while Dr. Tony was sitting there, expressing his sentiments by reference to certain biblical characters mentioned with emphasis, a car came up from the rear. And, shades of Moses, to his chagrin, he saw that it was no other than the last man in the world he wanted to meet just then—it was Dr. Jimmy. "Hello, Martin," said Jim, "You seem to be in bad." "Oh, No," said the cheerful liar, "I'll be out in a little while." "Yes, you will," said Jimmy, "You'll be out of that fix along about the Fourth of July, if you don't get some help. I have a cable here in my car; I believe we can hook on, and pull you out backward, so that you can go around by the other road and get through." So they pulled and tugged, they broke the cable, and tied it together again, they struggled and dug in the mud, but finally, as a result of one big pull, they got out to safety.

"No, what do you think of that," said the Doctor to me as he told the story. "Well," I said, "I think there are a lot of sons of guns running around loose!"

But a month or two after that, on a May morning, another thing occurred. Dr. Martin happened to step out of his office one morning, just in time to see a big dray team, frightened, lunging, with a scared driver trying to hold them by the lines. His first glance was almost one of amusement, as the feebleness of the man appeared almost ludicrous; but in a moment, he noticed that the team had broken away and was running up the street. He glanced in that direction, and his heart stopped beating; it seemed that the blood froze in his veins, as he saw, two blocks away, on the pavement in front of the plunging steeds, a little mite in blue—his baby Marie. To cover that space in seconds was impossible; he felt the impotence of mortality as against space and time.

And then, the miracle happened. Some man along the walk, darted out, grabbed the little form, and on across, but so close was the flying mass, that an end of a double-tree struck him, hurling him about, and tearing his clothing.

He straightened up, walked over to the side of the lot, and tenderly put little Marie down, inside the fence, frightened, but unhurt. Then he went into his office—the office of Dr. Jimmy; and Dr. Tony Martin knew.

A little later he walked in, and closed the door. He saw the man with the torn coat and the dusty garments. What mattered these things to him? No cloth of gold could ever look more noble; no diadem could ever adorn as did that dust. He walked over and said, "Jimmy, I've been a fool; a double-dyed, damned fool; but now I know something, and I want you to shake hands with me."

"Here we are, you and I, each struggling for a little livelihood, in these few days in which we live; our lives are all we get out of the struggle; let's make them a little nearer worth while. You and I have to struggle against selfishness, against ignorance, against superstition and filth, we work in the very sting of ingratitude; it's bad enough to carry all this load; its worse to carry it alone. Let's be friends from this time on; if it means the loss of dollars to me, then dollars be damned."

The years have rolled along, and Dr. Tony tells me he is happy. He says he has many things to make him glad—his family, his home, his friends, his good name; but classed as high as any other blessing is the fact that he holds the esteem of all his fellow practitioners. He says that money would not buy from him the clean taste in his mouth that come, from honorable, even generous and catholic treatment of his fellows.

But a strange thing has happened. It is that Doctor Tony hasn't lost any money, and he hasn't lost any respect of his community. He was losing both, before.

And now, in closing, I would offer, though in somewhat cryptic figure, these things: I would rather stand erect in the open, breathing in the pure air all about me, than sit in unventilated corners soothed to a simulation of joy by occasional squirts of *eau de cologne.* I would rather live in a community where general honesty and humanity guard my rights, than to sit with the erring, enforcing my safety with a club. I would rather own a moderately fertile quarter section in one of our Nebraska counties, than to own a section of coal-black loam, surrounded by Hades.

What do I mean? Just this, that no amount of personal struggle for adventitious gain or selfish benefit can ever count one-tenth as much in my well-being as an all-pervading, general atmosphere of good. If I do a dirty trick—if I cut a rate to the other fellow's client lower than I charge my own, if I underbid, or overstrain, or strike below the belt, my direct advantage may be slight; my disadvantage in the general demoralization will be great, if not overwhelming.

In centuries agone, men spent their lives trying to learn the mysteries of alchemy—that supposed science of transmuting base metals into purest gold. Later, on battle fields, armed with spears and lances, warriors contended for conquest that they might be enriched by booty. Then, at far eastern bazaars, shrewd traders tried, by trickery and deception, to turn their goods to wealth, even as a horse trader may seek now to cover blemishes in a contest of wits; but reserved for our day is the real victory of fellowship in competition. And though the Divine Architect denied to me the secrets of the alchemy they sought, he gave to us, with his benignant smile, the real magic wand of transmutation, the real uplifting power in civilization, the real darkness dispeller, the real builder of greatness in your life and mine, in this much feared, but mighty and beneficent competition, all blossoming into its greatest splendor, under the sunshine of good fellowship.

South Dakota State

The 38th Annual Meeting of the South Dakota State Dental Society will be held in Sioux Falls, March 29 to April 3, 1920. One week of post-graduate instruction will be given under the following clinicians: Dr. Arthur E. Smith, Chicago, Ill.; Dr. F. Ewing Roach, Chicago, Ill.; Dr. Dayton Dunbar Campbell, Kansas City, Mo.; Dr. T. W. Maves, Minneapolis, Minn.

DR. ERNEST W. ELMEN, *Secretary*,
608 S. F. National Bank Bldg.

Post-Graduate Course at Vanderbilt

The School of Dentistry, Vanderbilt University, announces a post-graduate course of two weeks duration beginning April fifth. This will be the first of a series of such courses to be given annually.

This post-graduate instruction will be handled entirely by the faculty personnel.

The range of subjects provided will give opportunity for each member of the class to choose those he feels the greatest need of reviewing.

A program will be published at an early date and may be had upon application.

The class will be limited to seventy-five.

DEWEY SCHOOL OF ORTHODONTIA

Many will be interested in knowing that the 1919 session of the Dewey School of Orthodontia, which was held in New York, at the College of Dental and Oral Surgery of New York, during July and August was such a phenomenal success that the members of the faculty have voted practically unanimously to continue the Dewey School in New York City.

Arrangements have been made with the College of Dental and Oral Surgery of New York to use its building, which is newly constructed and contains the very finest and most modern equipment.

The class of 1919 included a very large percentage of men who had but recently been discharged from the Dental Corps of the Army and the Navy. Several of the members had seen active service in France, and to a certain degree their work in the reconstruction of the jaws had stimulated their interest in orthodontia and caused them definitely to enter the specialty.

The Dewey School of Orthodontia, this past year, and this will hold good for the coming year, was very fortunate in having on its faculty, men who had served in the largest capacities and with great credit in the Dental Corps of the United States Army. In this connection we mention such men as Major Joseph B. Eby, whose skill as an orthodontist enabled him to very early attain a position of importance in the Maxillo-Facial Department, of the Walter Reed Military Hospital at Washington, D. C.; and Lieut. Col. V. P. Blair, who was the chief consultant in the Maxillo-Facial division of the American Expeditionary Forces.

The school is equally fortunate in having in its faculty such men as William K. Gregory, Professor of Vertebrate Paleontology, of the Columbia University, New York City, and Dr. Milo Hellman, whose work on the evolution of the face and morphology of the teeth is unsurpassed.

One of the chief reasons the faculty decided to continue its course in New York City was the unexcelled clinical facilities afforded. Several members of the faculty will be able to conduct an all-year-round clinic under their own operation and supervision which will permit of the demonstration of, and the application of, many varieties of appliances to the correction of the several classes of malocclusion. This clinic will be an exceptional feature because of the fact that cases can be so prepared as to be of the greatest teaching value.

In addition to the other former members of the faculty, (all well known in the specialty of orthodontia) will be added this year, the names of several more prominent men of orthodontia. The course will continue to be an eight weeks' course, and the entrance qualifications will be continued on the same high scale that they have been in the past.

EDITORIAL

ELIMINATION OF BUSINESS MATTERS FROM DENTAL SOCIETY SESSIONS

We often have wondered why more of our dental societies, particularly the State Dental Societies, do not eliminate business matters from the regular sessions and give the entire time to the literary and clinical program.

Perhaps this has impressed us more on account of the manner in which business affairs have been handled by the Ohio State Dental Society. For years it has had a Board of Directors to take charge of all business matters coming before the society, except the election of officers, and matters in which an extraordinary expense is involved; these are decided by the society itself. The election of officers, however, takes place immediately after the literary program of the afternoon of the first day of the meeting, so no time is taken from any of the regular sessions for business affairs. An *ad interim* committee of the Board takes care of any business that must be attended to during the interval between the annual sessions. In this way members who attend the annual meeting are being benefited throughout every session, and the literary program is not interfered with by business matters being injected here and there during the sessions of the society.

Those societies conducted under the old method seldom have more than a few papers presented at the meetings and much time of the sessions is taken up by discussion of business matters in which comparatively few are especially interested.

For comparison, those who have watched the programs of these societies will see that from four to six or seven papers is the sum total presented at an annual meeting. We were impressed sometime ago with the fact that one state society program contained only two papers, the president's address and one other presentation aside from the clinical features of the meeting. At the last meeting of the Ohio State Dental Society, there were on the program nineteen lectures, essays and talks, most of them illustrated with the lantern, on dental subjects of interest to the profession. Aside from these there was one banquet address, a number of toasts, and thirty-three miscellaneous clinics, given by that many clinicians. No business matters were brought before the assembly except the election of officers which took place between two literary sessions of the society.

We have mentioned the Ohio State Dental Society only for comparison and do not want to imply that it is the only state society conducted in this way. There are a number of others that dispose of business matters in a similar manner, and our National Dental Association has its House of Delegates to take charge of business affairs. What we desire is to call attention of society members to the two methods of conducting a meeting that they may decide which is preferable.

In these days when demands upon dentists are greater than ever before, when great problems confronting the profession have to be solved, and dentists are thirsting for more knowledge and seeking improved methods for many operations, it seems an injustice to allow anything to interfere with the interest of a society's sessions. Dentists want to get all the benefit possible from these yearly gatherings, and if they are given a full literary and clinical program, and that program is fully carried out, unhampered by business or other matters that interfere with the interest of the meeting, they return home feeling that they have been fully repaid for attending, and they look anxiously forward to the next annual gathering.

When societies are conducted in this manner the attendance will be larger, the interest more acute, and the benefits greater than is possible under the present methods followed by some societies.

We hope that the various State Dental Associations will give this matter due consideration and at least give a trial to the elimination of business matters from the regular sessions.

PROFESSIONALISM

On the last two days of November (1919) there occurred in Detroit a gathering of men and women representing some eleven professions. This gathering was most significant of the growing spirit of professionalism which is developing in the minds of many people in business life, as well as in the so-called professions.

The Inter-Professional Conference, as it was named, was conceived by men of both common sense and ideals, attributes not always concomitant. The opening address by Mr. Thos. R. Kimball presented some well expressed ideas that are worthy of careful consideration by the dental profession at this time. Mr. Kimball would discard the distinction which has long sought to limit the professions to the "clergy," "law," "medicine," "army," "navy," and would seek to establish a single fundamental qualification based on unselfishness and opposed to commercialism; and on that as a foundation he would erect a standard calling for skilled service wherein the common interest of all mankind is the first consideration, the client second, and self last. To this new organization he would gather all who can and will practice according to this creed, that is, all who have skilled brains and big hearts. The true spirit of professionalism has seemed of late to be yielding to the spirit of commercialism in, we believe, all of the so-called professions. Professionalism as opposed to greed is one hope whereby humanity may arise from the awful chaos into which we have been dragged. The spirit of professionalism is to give rather than to receive. Should not the so-called professions be the first to grasp this ideal and to so practice that they will be a living example to all mankind?

Let us, the dental profession, step to the front and practice true professionalism. Lay aside our greed for gold at the price of our honor.

—*H. R. C. W.*

ALUMNI ASSOCIATION UNIVERSITY OF BUFFALO DENTAL DEPARTMENT

SPECIAL POST-GRADUATE COURSE DURING

Alumni Week

April twelfth to eighteenth, 1920

Dr. L. M. Waugh, Columbia University Department of Dentistry New York, "Radiography."

Dr. Rupert E. Hall, Chicago, Ill., "Prosthodontia."

Major W. E. Cummer, Royal College of Dental Surgery, Toronto, "Detached Bridge Work."

Dr. C. E. Rose, Department of Dentistry University of Buffalo, "Conduction Anesthesia."

The course is especially designed for members of the Alumni Association, however, all Alumni and ethical dentists are eligible to attend.

Fees: Prosthodontia course, $50.00; two courses (except prosthodontia), $50.00; single course, $35.00. Classes limited to thirty men.

The hours for lectures and clinics have been arranged to permit of full enjoyment of the usual social events of Alumni Week. Apply immediately to

DR. J. C. ROBERTS,
174 E. Ferry St., Buffalo, N. Y.

Indiana State Dental Association

The sixty-second Annual Meeting of the Indiana State Dental Association will be held in the Claypool Hotel in Indianapolis, Ind., May 17-18-19-20, 1920.

A. J. KIMM, Secretary,
704-5 Citizens Bank Bldg.,
Evansville, Indiana

SUGGESTIONS

Conducted by F. R. Chapman, M.S., D.D.S., Columbus, Ohio

(*To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.*)

Removing Wax Model from Flask

In order to facilitate packing of the rubber, avoid over-heating the flask. Over-heating allows melted wax to penetrate the plaster and this keeps the rubber from adhering and remaining in place during the process of packing.

If this is avoided, the surface of the rubber remains clean and thus makes it easier to finish the case. If brass flasks are used the dentist's hands will not become soiled and consequently a very objectionable feature of packing will be eliminated.

Over-heating may be avoided in either one of two ways. One method is to place the flask in cold water and remove as soon as the water begins to steam. The other method is to place the flask in boiling water for exactly one minute and then separate immediately. The writer prefers the latter method because of the definite time element.—*D. D. C.*

Removing Separating Cloth from the Rubber

If the dentist packs with wet heat, a remedy is immediately at hand for removing the separating cloth from the rubber after the flask has been opened for inspection. Plunge the case into the boiling water and remove instantly, when the cloth may be removed without any difficulty.

—*D. D. C.*

Instructions to be Given Patient for Cleaning Artificial Dentures

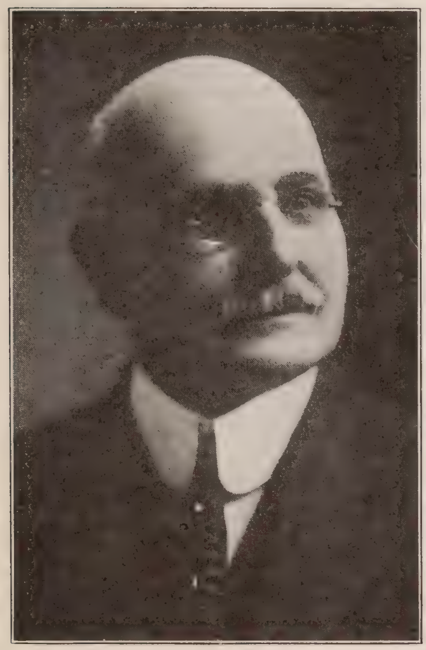
Artificial dentures would not be so filthy if the dentist gave proper instructions to the patient when the dentures were first inserted. If the patient begins to keep the dentures clean the satisfaction derived will furnish the incentive to continue the habit through the remainder of his or her life.

"Get a vegetable brush at the ten cent store, and a cake of Bon Ami at your grocer's. Scrub these teeth as vigorously and as often as you do your kitchen sink, and remember never to hold the lower in the palm of your hand as you may properly hold the upper. Hold one side of the lower between the thumb and two fingers while scrubbing the portion thus held. If you hold the lower in the palm of your hand, you will in all probability press the two ends together until you break it."

—*D. D. C.*

OBITUARY

Henry William Morgan, M.D., D.D.S.



HENRY WILLIAM MORGAN

AT NASHVILLE, Tennessee, January 17, 1920, there passed from earthly activity one of the best known, best loved and most highly respected men in the dental profession, Dr. Henry William Morgan, Dean Emeritus, Department of Dentistry, Vanderbilt University, in his sixty-seventh year, and the forty-third year of the practice of dentistry.

Dr. Morgan was the son of Dr. William Henry Morgan and Sarah Noel Morgan, and was born at Nashville, October 25, 1853. He was graduated from Vanderbilt, in 1875, receiving the degree of M.D. He was the first student to matriculate in Vanderbilt and the first to receive a degree from that institution. Two years later he received his D.D.S. degree from the Philadelphia Dental College, and began the practice of dentistry in the office of his father at Nashville, in 1877, that city having been his home until the day of his death.

He was Professor of Operative Dentistry, Vanderbilt University, from 1886 until 1919; Dean from 1911 until 1919; Dean Emeritus, 1919-1920.

Always active, progressive and earnest, a man whose principles and ideals were well known, he enjoyed to an unusual degree the confidence, respect and reverence of all who knew him. No one ever spoke his name in the hearing of the writer except in terms of highest admiration and approval.

He was a member of the National Dental Association, ex-president of the National Association of Dental Teachers, also ex-president of the Nashville Dental Association and of the Tennessee Dental Association.

He was also ex-president of the foreign relations committee of the National Association of Dental Faculties.

Dr. Morgan was also ex-president of the Vanderbilt Alumni Association, was president of the board of trustees of Walden university and president of the board of the Meharry Medical School, and a member of Delta Sigma Delta Fraternity.

The following tributes from his fellows in professional and college work is one that any man might be proud to hear:

God, the all-powerful Ruler of the destinies of man, who works in a wondrous way his mysteries to perform, has but now taken from us and unto Himself our greatly beloved brother and friend Dr. Henry William Morgan. A splendid Christian gentleman, loyal friend, true to his ideals of our profession, outspoken, fearless, yet an inspiration to all who knew him, he was a man among men, revered and loved.

He served the profession of dentistry for over forty years of his life well and intelligently. For many years he gave largely of his time and ability to the advancement of his profession, to the better opportunities and facilities for teaching students the advanced thoughts and sciences of the day.

As a professor and instructor in the School of Dentistry, of Vanderbilt University, he stood in the front rank of the highest class of educators. There is not a dentist or a dental organization anywhere that has not suffered an irreparable loss in his death.

He was a contemporary of Black, Kirk, McKellops, Bonwill, Noyes, Cushing and Johnson. He ran even race with these eminent men in high professional attainments.

We are confident that the spirit of his energies and love of fellowman still lives and will rest among us for all time and will forever contribute to our better welfare professionally and individually.

May his soul rest in peace, and may the memory of him and his deeds be graven deep in our hearts as well as on the tablets of the Hall of Fame erected in honor of the great men of our profession.

We, the Society of Dental Surgeons of Nashville, Tennessee, do feel our loss in the taking away of our beloved member more deeply than we know how to express.

A great sympathy goes out to the family. We mourn with them his passing from us, but glory in the knowledge that he rests in the bosom of his God.

Committee: D. M. Cattell
J. H. Phillips
R. Boyd Bogle

Nashville, Tenn., Jan. 21, 1920.

At a recent meeting of the faculty of the School of Dentistry of Vanderbilt University, called in honor of the memory of their late co-worker and leader, Dr. Henry W. Morgan, the following resolutions were unanimously adopted:

In the death of Dr. Henry W. Morgan, the dental profession has lost one of her brightest lights. Truly, his life was spent in the service of his fellow man, and in rendering this service, he lived true to an ideal which was ever dominant in his heart. His was a positive character. With strong convictions, in defense of which he was outspoken and fearless, there mingled such kindness of heart and absolute loyalty to friends, that those whose rare privilege it was to know him well will always feel the imprint of his personality in their lives.

Dr. Morgan sought truth for its own sake; with error he was uncompromising. During his lifetime he did more to advance the cause of dental education and to uphold the highest standards of dentistry than any other man in the South. His close connection with the School of Dentistry, Vanderbilt University, both as Dean and Professor of Operative Dentistry, gave opportunity for some of the most far-reaching activities of his whole life. In the history of this Institution, the name of Dr. Morgan will occupy a place second only to that of his illustrious father. We who have been cheered and heartened by his friendship and have profited through his council and leadership, feel his absence keenly. Our palms yet tingle with the sincerity of his handclasp, and his clear sharp eye still looks encouragement and hope into ours. He did good deeds with singleness of heart without ostentation. Many of us recall instances of Dr. Morgan's nobility of soul. The widow, the orphan, the struggling student, the young dentist blue and discouraged—all received something which made life's burdens lighter. As we gather in our minds the fruits of his life and note their quality, we feel that he indeed caught the spirit of the Master. When we come to view the good that was in the life of our departed friend, his faults sink into insignificance. Thus it is with all who live for the highest.

Words, we know, but poorly express the profound sentiments of our souls. Yet, we take this means of paying, as best we can, a tribute of respect and love to the memory of our brother, and of expressing our sincere sorrow in his death. We shall not look upon his earthly face again. His voice is hushed among us. Yet, have we really lost him? Has he passed out of our lives forever? No! While the body is reposing in Mother Earth, his work, his spirit are with us still. His work remains a monument imperishable; his spirit, the "flaming torch," is thrown to us. This we must catch and bear aloft as we follow in his footsteps.

In expressing our sense of loss, we do not forget the bereaved ones in the home. Our hearts go out to them in their hour of deep sorrow, and especially do we sympathize with her whose devotion to our brother was the joy and inspiration of his life. May her sorrow be tempered in the contemplation of a life so worthily spent. Dr. Morgan did not live in vain. He tasted the joys of noble achievement and passed the cup to others. Let all of us find solace in the assurance that he has already heard the Master say, "Well done, thou good and faithful servant. Enter thou into the joy of thy Lord."

Dr. Morgan was married to Miss Matilda Alloway Evans, of Nashville, November 3, 1880. Mrs. Morgan and the five children of the marriage, William H. Morgan of Dallas, Tex., Mrs. William C. Weaver, Mrs. Palmer C. McClester, Mrs. S. Cecil Ewing and Dr. Walter M. Morgan, of Nashville, survive him. His two brothers, Joe B. Morgan and Garnett N. Morgan, live in Nashville, while his sister, Mrs. Chas. H. Noyes, lives in Warren, Pa.

Dr. H. F. Billmeyer

On January 2, 1920, at 10:30 A. M., while conversing with friends in a drug store at Bellevue, Ohio, where he had practiced many years, Dr. H. F. Billmeyer sank to the floor and expired of heart failure, aged 64.

The end come thus, suddenly; but was not unexpected. At Onsted, Mich., where he had visited only a few days before his death, he remarked to friends that they never should see him alive again. And to a cousin an hour before his death, he gave certain directions concerning his funeral, which he desired to be very modest, without singing.

Dr. Billmeyer was known for his kindly and charitable acts, and will be greatly missed.

Funeral services were held at Bellevue, January 4, and the body was taken to Onsted, Mich., for interment, where the final scene was enacted, January 6, 1920.

B. Holly Smith, M.D., D.D.S.

B. HOLLY SMITH

DR. B. HOLLY SMITH, one of the best known members of the dental profession, died at his home in Baltimore on January 22, 1920. Heart disease was given as the immediate cause of death.

Dr. Smith was born at Piscataway, Prince George county, Maryland, in March, 1858.

He graduated from the Baltimore College of Dental Surgery, with the D.D.S. degree, in 1881. He received the M.D. degree from the College of Physicians and Surgeons, Baltimore, in 1883.

He practiced his profession for thirty-seven continuous years and had a large clientele.

One of the greatest interests of his life was the establishment of oral hygiene methods in the public schools. During the latter part of his life this effort received a great deal of his time and he spent his finest energies and enthusiasm in its behalf. It was one of the most gratifying experiences of his life that he lived to see the plan adopted.

He was president of the faculty of the Baltimore College of Dental Surgery, and Professor of Dental Surgery and Operative Dentistry in the institution, chairman of the executive council of the National Association of Dental Faculties, chairman of the Oral Hygiene Council, of Maryland, a former president of the National Dental Association, Southern Dental Association and Maryland State Dental Association.

He was a member of the American Academy of Dentistry and a fellow of the Federation Dentaire Internationale, and was furthermore associated with a great number of state and district associations, and a member of Delta Sigma Delta Fraternity. In addition to his strictly professional affiliations he was president of the Maryland State Game and Fish Protective Association. He was a lover of animals.

Dr. Smith is survived by his widow, Mrs. Frances G. Smith, and four sons, Dr. B. Holly Smith, Jr., W. Conwell Smith, F. Janey Smith and F. Noel Smith. Three brothers, Prof. Wilbur F. Smith (president of Baltimore City College), Dr. G. Marshall Smith and Beverly W. Smith, of the Second Branch City Council, and one sister, Mrs. Richard S. Lynch, also survive him.

SOCIETY·ANNOUNCEMENTS

Psi Omega Fraternity

The Reunion and convention of the National Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, July 12, 13 and 14, 1920.

Indiana State Board

The next Indiana State Dental Examination will be held in Indianapolis, June 14th to 20th inclusive.

Applicants will be accepted from class A and B colleges.

Preliminary educational certificates must be examined by State Superintendent of Public Instruction two weeks in advance of the examination.

For further instructions and application blanks, address H. C. McKittrick, D.D.S., 1006 I.O.O.F. Bldg., Indianapolis, Ind.

Michigan State Dental Society

The next annual meeting of the Michigan State Dental Society will be held at the Hotel Statler, Detroit, Michigan, April 12, 13 and 14, 1920.

The chairman on local arrangements is William H. Waller, 613 Washington Arcade, Detroit, Michigan, and the secretary, Claude S. Larned, 614 Post Building, Battle Creek, Michigan.

Illinois State Dental Society

The Ffty-sixth Annual Meeting of the Illinois State Dental Society will be held in the Congress Hotel, Chicago, March 22, 23, 24 and 25, 1920.

The following essayists have been secured: Dr. Alfred C. Fones, Bridgeport, Conn.; Dr. Charles S. Essig, Philadelphia, Pa.; Dr. Wm. H. G. Logan, Chicago; Dr. Newton G. Thomas, Chicago; Dr. Hart J. Goslee, Chicago; Dr. F. E. Roach, Chicago; Dr. K. W. Knapp, Des Moines, Ia.; Dr. A. A. Herdliska, U. S. Public Health Service, Washington, D. C. A most cordial invitation is extended to all ethical practitioners in Illinois and neighboring States.

G. WALTER DITTMAR, *Pres.*
J. P. LUTHRINGER, *Secy.*

Pennsylvania State Dental Society

The Fifty-second Annual Meeting of the Pennsylvania State Dental Society will be held in the Rajah Theater, Reading, Pa., April 27, 28 and 29, 1920. An interesting and instructive program has been prepared. All ethical practitioners are invited to be present.

W. L. FICKES, *Secretary*,
6004 Penn. Ave., Pittsburgh, Pa.

Oklahoma State Dental Society

The next meeting of the Oklahoma State Dental Society will be held in Tulsa, Oklahoma, March 15, 16, 17, 18, 19, 20, 1920. This meeting will be conducted on the class system of post-graduate instruction.

The attendance will be divided into classes, by enrollment previous to the time of the meeting, and each class will take up the intensive study of one subject for the full week.

At this time the following teachers have been engaged:

Dr. Thos. B. Hartzell, Pyorrhea and Prophylaxis; Dr. Arthur E. Smith, Nerve Blocking and Anesthesia; Dr. Dayton D. Campbell, Full Dentures; Dr. F. E. Roach, Partial Removable Dentures; Dr. T. W. Maves, Inlays and Abutments for Vital Teeth.

These teachers will have assistants to help with the class work. The instruction will consist of lectures, technical and practical demonstrations. Ample facilities will be provided for clinical instruction and where possible the students of each class will be expected to do much of the practical work.

This meeting is one of a chain of meetings to be conducted by the Texas, Kansas, South Dakota and Oklahoma State Dental Societies. Any dentist, in good standing in his state society with 1920 dues paid, desiring to do so, will be permitted to attend the Oklahoma meeting provided the class of his choice is not filled by our own members.

The class fee is fifty dollars. The Bulletin of the Oklahoma State Dental Society which gives full information about our meeting, will be mailed to any one upon request.

C. R. LAWRENCE, *General Manager*,
Stephenson Bldg., Enid, Okla.

Annual Convention Texas State Dental Society

The Texas State Dental Society will hold its 40th annual convention March 8-13, 1920, at Dallas, Texas.

The special feature of this meeting will be post-graduate class courses conducted on the "Oklahoma Plan".

These classes will be conducted by the following well known men: Dr. Thomas B. Hartzell, Minneapolis, Minn;. Dr. F. Ewing Roach, Chicago, Ill.; Dr. Arthur E. Smith, Chicago, Ill.; Dr. Dayton D. Campbell, Kansas City, Mo. and Dr. T. W. Maves, Minneapolis, Minn. Other teachers may be employed.

J. G. FIFE, *Secretary*,
736 Wilson Bldg., Dallas, Texas.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

Occasionally somebody writes something very much worth while for the lay press, as witness the subjoined editorial from the Toledo Times. It is well worth reading, and the finger touches the exact spot. All this whining stuff from Germany is merely part of the game to get off as easily as possible; like the bully when the small boy has him down and is playfully chewing his ear.

Germany's Criminal List

If the Allies had so willed, they could have been deaf to Germany's petition for an armistice and carried the war to the gates of Potsdam. The morale of the German army was gone and Foch's wonderful organization was at the height of its driving power. Nothing could have stopped its advance except the voice of Foch. The territory of the enemy might have been overrun, and made desolate even as the Germans treated Belgium and northeastern France. Then having forced the German nation to unconditional surrender, the Allies would have been justified in decreeing that the empire be blotted off the face of the earth, as a surety that it never again would gather strength or nourish the desire to start a world war.

Germany had made herself liable to the maximum punishment. She entered the war determined to win by whatever means came to her hand without regard to human rights. Her soldiers were instructed in the refinements of terroism and neither age nor sex was to be considered. So babies were bayonetted, mothers cruelly mutilated and the aged tortured as a means of crushing the fighting spirit of the people in the presence of whom these outrages were committed. Nor did Germany hide her intent. France was to be broken, England humbled and Russia chained to the Germany chariot. A Prussian triumph meant the absolute domination of Europe and eventually of the world. It was Wilhelm's boast that as soon as he had cleared the atmosphere of Europe to suit his fancy, he was going to present the bill of expense to Uncle Sam and proceed, with its collection in his inimitable way.

Usually where no quarter is given no quarter is expected, and yet there has been a continuous whine from Germany from the day the victorious Allies began formulating the conditions of peace. This whine expanded into a roar of protest when it became known that the Allies were insistent for the punishment of the persons who had outrageously offended humanity under the cloak of military necessity. And the strange part of it is that some of the Allies are urging leniency as if they were already doubting the reality of the more than four hideous years which enveloped a whole world in misery. One of the arguments advanced is that the crimes alleged were as much against the Germans as against other peoples. But the Germans were willing partners. For 40 years they were the facile tools with which the Prussians constructed the mighty engine of war and they knew to what purpose this engine was to be employed. The strongest proof that Germany is still unregenerate is the unwillingness of her people to hand over the arch conspirators.

No punishment severe enough can be visited on a few hundred people commensurate with the unparalleled crimes perpetuated by a nation of Huns, and since the Allies have chosen to leave Germany practically intact, the punishment of the leaders must take a form that will serve as a warning to others and as a security to humanity. "It is not the severity but the certainty of punishment that is society's greatest protection."

If Prussian militarism is not placed on trial peace will be a mockery.—*Editorial, Toledo Times.*

Jackson, Mich., is to have full-time clinic service, with Dr. Russell Curtis in charge.

Springfield, Mo., dentists have been asked to join the local Credit Exchange. Now, somebody start a movement to get them to enter such associations everywhere. There's no reason why dentists should extend credit blindly, as most of them do.

Here's a suggestion: Let's start a DENTAL SUMMARY Business Advice Club. Every subscriber is hereby invited to ask one question concerning his financial problems, to which an answer may be given requiring not to exceed a hundred words. Each question must be accompanied by the name of the writer, not for publication of course, and both questions and answers are to be printed in this department. No charge is to be made for the service. A great deal of good ought to be accomplished as every subscriber will have the opportunity to learn the problems that others have to wrestle with, while the answers given may be beneficial to many. Address questions to: Summary Business Club, Drawer 905, Toledo, Ohio. Nobody will read them except myself, and all names will be regarded as confidential. Answers will be prepared by men well up in the business world, who have succeeded solely through their own efforts.

Dr. Christopher Schott, Louisville, Ky., has been acquitted of the charge of murdering his young office assistant.

Baylor Dental and Medical College, at Dallas, Texas, has been awarded an endowment of $500,000, also $40,000 in cash for running expenses, by the Baptist General Convention that met recently in that city.

Astoria, Oregon, now has school clinic. The dentists worked it up, of course.

Wish every dentist would constitute himself a committee of one to spread genuine Americanism in his territory. The latest discovery is that a committee of five hundred "reds" has been organized, for the purpose of worming their way into industries and then proceed to plant seeds of sedition and anarchy. Every man who calls himself American should do his utmost to counteract this insidious vice. Let alone it is as sure to destroy America as the worm at the heart of the giant oak is sure eventually to bring it down.

College of Dentistry, University of Buffalo, graduated six men at its mid-term commencement, January 26th.

The S. S. White Dental Mfg. Co., celebrated its seventy-fifth anniversary, January 24th.

Mayor Hylan, New York, has signed the Dental Clinic Ordinance, creating the Division of Oral Hygiene, and appropriating $40.000 for the establishment and maintenance of such clinics as may be necessary to provide protection for the children of that city against dental disease and deterioration. This action puts New York city on the oral hygiene map.

Dentists are almost unknown in Serbia, there being but one dentist in the Serbian army. The Red Cross is searching for volunteers among American dentists. The need is pressing.

Hon. James J. Thomas, Mayor of Columbus, Ohio, has recognized the dental profession in his list of appointments. In 1905 a dental section was established in the Columbus Public Library, and has been fostered by the Ohio State Dental Society, and the cooperation of its many friends throughout the country, until it now contains about two thousand volumes on dental subjects. Many volumes of such scarcity that it would be practically impossible to duplicate.

In recognition of this valuable acquisition to the library by the dental profession, he has appointed Dr. Edward C. Mills on the board of library trustees for the term of four years.

Ohio—Central

Marion, Ohio, Feb. 4.—After selecting Marion again as the next annual meeting place and hearing an address by Dr. W. H. Wright, of Rio de Janeiro, South America, formerly of Dayton, Ohio, the Central Ohio Dental Society, in convention here, this afternoon elected these officers: President, F. P. Leonard, Bucyrus; vice-presidents, John Pfannstiel, Delaware and R. C. Bratton, Galion; recording secretary, L. T. McKinney, Richwood; corresponsing secretary, F. C. Delashmutt, Bucyrus; treasurer, F. C. McGaughy, Galion.

Ohio—North Central

Fremont, Jan. 29.—The Northern Central Ohio Dental association held its first quarterly meeting for the year 1920, in the spacious dining room of the Hotel Fremont, Wednesday evening. Twenty members and their guests sat down to a fine dinner that was served in the famous Hotel Fremont style. After dinner, W. T. Orr, of Detroit, expert on memory and psychological topics, entertained the assembled guests with an interesting talk. The association takes in the territory of Sandusky, Huron and Erie counties. The next quarterly meeting will be held in Sandusky in April.

Indiana—Grant County

Marion, Ind., Jan. 29.—The Grant County Dental Association was organized at an enthusiastic meeting held Wednesday night in the rooms of the Association of Commerce. There was a good attendance, and the following officers were elected: President, S. E. Stouffer; vice-president, H. F. Gravelle; secretary, J. B. Gordon; treasurer, O. M. Flinn; supervisor of clinics, Otto H. Schrader, of Jonesboro.

Meetings will be held on the first Thursday of each month.

Indiana—Thirteenth District

South Bend, Ind., Jan. 13.—T. J. Walsh, of South Bend, was elected president of the Thirteenth District Dental society at its annual meeting, held in the Rotary room at the Oliver hotel Monday evening. Other officers chosen were G. F. Hitchcock, Plymouth, vice-president; Ivan E. Smith, Mishawaka, secretary, and W. L. Millstead, Mishawaka, treasurer.

Following a banquet at 6 o'clock a business meeting was held. During the course of the evening, R. H. Volland, professor in the University of Iowa, conducted a clinic and delivered a lecture on "The Casting of Gold Inlays."

New York—Fourth District

R. C. Petrie, of Johnstown, has retired as President of the Fourth District Dental Society which held its fifty-second annual meeting in Schenectady, January 22. Five Schenectady men were elected officers as follows: Wilber D. Rose, president; Paul Maier, vice-president; Harold Mead, secretary; O. J. Gross, treasurer; and F. T. Wilcox, corresponding secretary.

Georgia—Eleventh District

Brunswick, Ga., Feb. 7.—The Eleventh District Dental Society, a branch of the state society, was organized at Waycross on Thursday, when a number of dentists met and elected G. R. Lovelace, of Waycross, president; A. A. Lowery, of Valdosta, vice-president and Frank B. Atkinson, of Brunswick, secretary and treasurer. The next meeting of the society will be held in Waycross, on Thursday, May 6.

The Rochester Dispensary

ANNUAL MEETING SHOWS IMMENSE RESULTS

The annual meeting of directors of the Rochester Dental Dispensary took place January 22. In his report to George Eastman, founder of the institution, and the board of directors, Dr. Harvey J. Burkhart, director, said that, so great is the interest in the scope and work of the Rochester Dispensary, that inquiries are received every day from various countries for copies of the plans and methods employed here. Last year requests came from the British Government for advice and suggestions for the purpose of framing new dental legislation for Great Britain and also for plans and suggestions for the establishing of dental clinics. The governments of Australia and New Zealand send personal representatives to the dispensary for the purpose of obtaining information to obtain legislation and appropriations for inaugurating the Oral Hygiene movement and for the establishing of dental clinics.

The bookkeeping system and general business and financial plan has been commended upon by investigators, and general dental organizations have adopted the business system of the institution. The plan of the work in the dental department is preventive, rather than reparative. Operations in the surgical department were commenced last autumn. Up to the present, its activities have been confined to the removal of tonsils and adenoids. It is expected that operations for cleft palate, harelip and all other operations about the mouth will be performed.

The research department is in charge of Dr. Stearns S. Bullen and it is expected that much valuable information may be obtained by elaborate chemical and biological tests and studies which will be made.

The social service department is conducted in a broad, reasonable and efficient manner. Emergency cases receive first consideration and attention regardless of the rules for eligibility.

Twenty-four young women were graduated in the Class of 1918-1919. At the present time there are 52 in the class of 1919-1920 and it is expected that several more will come in for the short course commencing on February 1st. The enrollment for this year is much larger than that of any other school for the education of young women to be dental hygienists.

The work of these graduates has given satisfaction. During the war, many were employed by the government in various hospitals and there is now on file at the Dispensary, applications for the services of these dental hygienists in hospitals all over the United States, and with schools and health boards as well as with dentists throughout the land.

The prophylactic work in the local schools, has been done by squads of licensed dentists from the dispensary, graduate dental hygienists in charge of a licensed dentist and students taking the dental hygienists' course also in charge of licensed dentists.

The following officers and board of directors of the Dental Dispensary were re-elected: President, William Bausch; vice-presidents, Thomas B. Dunn and Edmund Lyon; treasurer, Andrew J. Townson; secretary, James S. Havens, and director, Harvey J. Burkhart, D.D.S. The board of directors consists of William Bausch, Harvey J. Burkhart, George H. Clark, Thomas B. Dunn, Albert B. Eastwood, Gustave Erbe, Thomas W. Finucane, James S. Havens, Edmund Lyon, Albert E. May, Joseph Michaels, Charles P. Schlegel, Robert C. Shumway, F. Harper Sibley, George W. Todd, Andrew J. Townson and Herbert S. Weet.

Rochester Class of Assistants

At the Dental Dispensary School, fifteen short-term pupils completed their courses January 27. They will take their state examinations next week, and their diplomas will be awarded in June. The class and its officers follow: President, Helen M. Baukin, of Beloit, Wis.; vice-president, Carolyn I. Haskin, of Rochester; treasurer, Norma Olsen, and secretary, Grace Gifford, and Anna L. Baker and Hazel Holmes, of Rochester; Irene Bertrand and Stephanie Coppens, of Marquette, Mich.; Lena W. Buxton, of Worcester, Mass.; Edna F. Douty, of Pittsburg, Pa.; Lena M. Gust, of Champaign, Ill.; Margrete Lassen, of Ithaca, Mich.; Abecca Morris, of Livonia; Byrd R. Silverman, of Syracuse; Edith Steele, of Chillicothe, Ohio; Alice H. Westreland of Streator, Ill., and Mrs. Florence Van Graaseiland.

U. S. Public Health Service

DENTAL EXAMINERS APPOINTED BY THE BUREAU OF WAR RISK INSURANCE

Up to February 18, the following appointments have been reported: McMinn county, Tennessee, Dr. James S. Vaughn, Athens; Darke county, Ohio, Dr. S. F. Ridings, Greenville; Benton county, Indiana, Dr. Walter T. Clark, Fowler; Rensselaer county, New York, Dr. J. J. Purcell, Troy; Vanderburg county, Indiana, Dr. LeRoy Fink, Evansville; Grant county, Indiana, Dr. H. F. Gravelle, Marion; LaSalle county, Illinois, Dr. Guy A. Karr, Ottawa; Rock Island county, Illinois, Dr. Sidney A. Wiggins, Rock Island; McDonough county, Illinois, Dr. C. P. Jackson, Macomb; Cattaraugus county, New York, Dr. J. J. McCarthy, Olean, and Dr. J. I. Kerns, Salamanca; Peoria county, Illinois, Dr. C. E. Chamberlain, Peoria; Monmouth county, New Jersey, Dr. John L. Remsen, Asbury Park; Lake county, Illinois, Dr. Charles B. Johnson, Waukegan; McLean county, Illinois, Dr. E. W. Chrisman, Bloomington.

There Will be No Comment, Because It Says, in Itself, Many Mouthfuls

Mrs. W. J. Nixon, who recently had her teeth extracted and was shut in, was very much surprised yesterday when twelve ladies, her most intimate friends, came in a body and, smiling when entering, removed their teeth so she would not feel embarrassed when talking. They brought with them oysters and the trimmings—From the *Mankato, Kan. Free Press*—Contributed by *Dr. C. D. Peck, Sandusky, Ohio.*

Doctors Service Corps

New York, Feb. 9.—War against quackery has been declared by a new national organization of physicians, surgeons and dentists, the Doctors Service Corps. Cooperative service, the detection and punishment of "dead beats" and an intelligence service to operate against frauds are the main objects of the new association.

The movement has received the indorsement of Prof. Irving Fisher, of Yale, Major A. R. Crane, formerly chief dental surgeon, U. S. A., General Hospital No. 1, and Herbert D. Brown, chief of the bureau of efficiency at Washington. Headquarters have been established at 1457 Broadway.

American Academy of Dental Science

Chicago, Feb. 4.—The American Academy of Dental Science today condemned gold crown work on teeth as unsanitary and productive of diseases.

"Gold in the mouth in any form is out of date and not conducive to general good health," a resolution passed by the convention read. The organization also condemned the removal of nerves from decayed teeth preparatory to filling or bridge work.

One delegate declared present methods of extracting teeth needed to be changed. Extractions in cases of persons over twenty years of age should be made in hospitals, with the same treatment accorded other operations, he said.

Institute of Dental Teachers

Detroit, Mich., Jan. 29.—With the election of officers for the coming year, the twenty-seventh annual meeting of the American Institute of Dental Teachers closed today noon, in the Hotel Statler. Arthur Black, Chicago, was chosen president, Guy Mullberry, San Francisco, vice-president, and A. Hoffman, Buffalo, secretary-treasurer. Following the formal close of the meeting the delegates many of whom had come from Europe to attend the annual session and discussion, visited the manufacturing establishment of Parke, Davis and Company, Jefferson avenue.

Manitoba Dental Association

Winnipeg, Man., Jan. 16.—At the annual meeting of the Manitoba Dental association it was reported that practically one-third of the dentists of Manitoba had enlisted during the war, most of them in the Army Dental corps. The part taken by them in this department opened the eyes of the military heads as to the value of such a corps to an army, and also taught the soldier in the ranks the value of good teeth in the preservation of health, speakers at the meeting declared.

The new officers of the association are: President, G. F. Bush; vice-president, J. H. Greenfield; secretary, C. P. Banning; registrar-treasurer, H. F. Christie. The other members of the board are Capt. D. P. Stratton and Major H. A. Croll.

The National Research Council

The Carnegie Corporation, of New York, has announced its purpose to give $5,000,000 for the use of the National Academy of Sciences and the National Research Council. It is understood that a portion of the money will be used to erect in Washington, a home of suitable architectural dignity for the two beneficiary organizations. The remainder will be placed in the hands of the Academy, which enjoys a federal charter, to be used as a permanent endowment for the National Research Council. This impressive gift is a fitting supplemen to Mr. Carnegie's great contributions to scince and industry.

The Council is a democratic organization, based upon some forty of the great scientific and engineering societies of the country, which elect delegates to its constituent Divisions. It is not supported or controlled by the government, differing in this respect from other similar organizations established since the beginning of the war in England, Italy, Japan, Canada and Australia. It intends, if possible to achieve in a democracy and by democratic methods the great scientific results which the Germans achieved by autocratic methods in an autocracy while avoiding the obnoxious features of the autocratic regime.

The Council was organized in 1916 as a measure of national preparedness and its efforts during the war were mostly confined to assisting the government in the solution of pressing war-time problems involving scientific investigation. Reorganized since the war on a peace-time footing, it is now attempting to stimulate and promote scientific research in agriculture, medicine, and industry, and in every field of pure science. The war afforded a convincing demonstration of the dependence of modern nations upon scientific achievement, and nothing is more certain than that the United States will ultimately fall behind in its competition with the other great peoples of the world, unless there be persistent and energetic efforts expended to foster scientific discovery.

Tired of Reform

"I want a passport," said a handsomely dressed man to Thomas V. Sell, chief of that bureau in the Federal Building. "I am Dr. ———" and he handed the official his card showing dental offices.

"Where to?" asked Mr. Sell.

"O, anywhere," said the dentist. "Don't care where to—just so I can get from this reform, reform, reform. A feller can't get a drink of wine, or beer, or whisky or anything worth a continental. Now down in South Carolina or somewhere they're legislating tobacco and cigars out of our mouths. First thing you know the cranks will have that up before Congress. "Won't be long before they'll tell us we must part our hair in the middle at a certain time each day, and wear polka dot windsor ties again."

"Try Cuba," suggested Mr. Sell

"All right," replied the doctor.

And he's on his way.

Fluxes

ARE the fluxes you are using satisfactory in all respects? You know that soldering and casting are delicate operations and that the flux you employ helps to determine your degree of success.

The Ney Fluxes

(Weinstein Formulae)

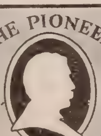
were not developed empirically; they are the product of exact science and each meets the definite requirements of the class of work for which it is prepared.

Ney's Soldering Flux
Ney's Reducing Flux
Ney's Oxidizing Flux

Procure them from your dealer and test their merits; or write to the manufacturer for description of properties.

IF YOUR DEALER CANNOT SUPPLY ANY ARTICLE OF OUR MANUFACTURE, WRITE TO US

THE PIONEER



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FOUNDED IN 1812
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HARTFORD CONNECTICUT, U.S.A.

NEW GOLD FOR
PRECIOUS METAL PRODUCTS
OLD GOLD, SILVER
PLATINUM ETC.

NOTICE
To Readers of Summary!

The formula as presented to the profession through the pages of *The Dental Cosmos*, under title:

Post-Operative Pain Control
By Alonzo E. Case, Ph. G., D.D.S.
is now obtainable in the ideal staple form of tablets, as suggested in article as being best form. Never has an article or formula on this subject been approved and endorsed by so many of the biggest, best known dentists and physicians as a harmless scientific post-pain control.

ACTIVATED TABLETS
SEDAVOL
(CASE)

Control pain by action on the sensory nerves and nerve endings. They are administered by mouth and become effective in one-half the time usually necessary. They positively control most severe types of post pain.

Dental size through your supply company.

Literature in each package, summary of article and uses. Have your druggist order druggist size for your prescription. Literature on request.

Dental Pharmaceutical Co.
Holton, Kansas

Kansas City Plans Clinic

Kansas City, Mo., Feb. 6.—Kansas City is to have a free dental clinic for children in the near future if the plan of the dental commission of Kansas City is realized. Thirty members of the executive committee, headed by Dr. A. J. McDonald, have been working on the plan since last Saturday, when $5,000 was subscribed to the fund. Committee members plan to collect an additional $10,000 from Kansas City dentists to complete the fund.

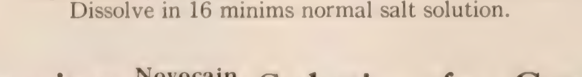
In outlining the plan, Dr. McDonald said that the clinic would be centrally located in a building to be purchased later. The central clinic plan has been tried for the last two years, but is not to be maintained longer. Dr. McDonald said that the present plan is to take the place of the former and in addition would care for all poor children's teeth. The clinic board would employ four or five Kansas City dentists to operate the dispensary.

Dr. McDonald pointed out that the $15,000, original cost price, was to be furnished by no one except Kansas City dentists. It is then planned to get twenty-five Kansas City business men to maintain the clinic for five years. Those in charge of the work believe that it will be taken in under the city budget. Six of the twenty-five men have already agreed to support the project.

"The committee expects every dentist in Kansas City to do his part," said Dr. McDonald. "When the public sees that the dental profession is in earnest we will then enlist its help."

Nontoxo TRADE MARK (Procain E) Tablets
(The Anesthetic Without Cocain)

Always Fresh



FORMULA:

Novocain (Procain) ....0.02 Gram
Suprarenin (Synthetic)...................0.00005 Gram
Dissolve in 16 minims normal salt solution.

For Preparing Novocain (Procain) Solution for Conductive and Block Anesthesia

Price, per vial of
50 Tablets, $1.25
12 Vials, . 13.50

The Ransom & Randolph Company
TOLEDO, O. U. S. A.
CLEVELAND — COLUMBUS — GRAND RAPIDS
FLINT DETROIT AKRON

Your Dealer

DEATHS

At St. Louis, Mo., January 10, Dr. Guy Singletary, of Clinton, Ky., aged 38.

At Brooklyn, N. Y., January 31, Dr. Bernard Lichter, aged 23.

At Montclair, N. J., February 1, Dr. Albert J. Wright, aged 71.

At Baltimore, Md., February 5, Dr. H. Roscoe Aldridge. His wife died the morning of February 4. Both were taken by pneumonia.

At Camden, N. J., February 8, Dr. Marvin A. Street, of Moorestown, aged 45.

At South Boston, Mass., February 7, Dr. James L. Brosnahan, aged 38.

At Hartford, Conn., February 9, Dr. James McManus, aged 84.

At Jersey City, N. J., February 9, Dr. Robert L. McKinney, aged 27. He was attached to the dental clinic at Bellevue Hospital.

At Randolph Mass., January 28, Dr. Herbert F. Langley, aged 39. He was an instructor at the Harvard Dental school.

At Lockhart, Texas, January 7, Dr. David A. Combs.

At Buffalo, N. Y., January 23, Dr. Ernest G. Graff, aged 46.

At Poughkeepsie, N. Y., January 27, Dr. Michael W. Battle, aged 30.

At Tonawanda, N. Y., February 3, Dr. Myron J. Dixon, aged 57.

At Freeland, Md., February 5, Dr. Eugene E. Hoffman, aged 58.

Special Ruling on Reinstatement of War Risk Insurance

Under a new and very liberal ruling of far-reaching importance to millions of former service men, issued by Director R. G. Cholmeley-Jones, of the Bureau of War Risk Insurance with the approval of Secretary of the Treasury Carter Glass, War Risk (term) Insurance, regardless of how long it may have been lapsed or canceled, and regardless of how long the former service man may have been discharged, may be reinstated any time before July 1, 1920.

The only conditions are:

1. Two monthly premiums on the amount of insurance to be reinstated must accompany the application.
2. The applicant must be in as good health as at the date of discharge, or at the expiration of the grace period, whichever is the later date, and so state in the application.

The new ruling is the most important liberalization of War Risk Insurance since the passage of the Sweet bill, and is designed for the special benefit of service men who failed to reinstate their insurance prior to the new law, and who have been discharged more than eighteen months.

Ex-service men may still reinstate their lapsed term insurance at any time within

Classified Advertisements under this heading, $2.00 each for 60 words or less; additional space, 2 cents per word, single insertion; three insertions or more, special rate on application.

FOR SALE—Established practice in Schofield Building, Cleveland, Ohio. Modern equipment. Will sell for $2,000; part on time. Am selling to go into business. Address, 330C, Schofield, care The Ransom & Randolph Co., Rose Bldg., Cleveland, Ohio.

FOR SALE—Western Ohio dental office. Located in midst of prosperous farming community. They have the money and willing to pay good prices for good service. With $750.00 you can be so located. Good practice and fees. Invoice is the cost. Equipment and furniture in excellent condition. Low rents. Must have a change of climate. Address, 340P, care of The Dental Summary.

MAKE MORE MONEY—Increase your practice. Be called a successful dentist and business man. One extra patient may pay for entire set. One for each week in the year. Fifty-two high-class educational talks and business builders. Written by one with many years of experience and high standing. Write for sample at once. Address, Modern Dental Co., Centralia, Ill. 350P

WANTED—Dental Inventions and Discoveries—appliances, instruments and medicines; marketed to best advantage and profit to the dentist owning them. Fees reasonable. Advice gratis. Address, C. J. Drake, 119, 16th Ave. So., Nashville, Tenn.

WANTED HELP—Will pay about what seem to be worth by comparing profits Age 55½. About good work as patient will allow. Must be honest consultation, representation to prospective patients. Batch. Good place for rich student, fond of work to get patients indirectly for little pay. Very little practice. Centrally located. Address, Dr. W. E. Stewart, Morgantown, W.Va. 310P

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MATERIALLY AIDS
Local Treatment in
PYORRHEA
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X R A Y A complete course of private instruction in DENTAL ROENTGENOLOGY is offered. Special attention to technic. Address
W. I. LE FEVRE, M.D.
452-454-456 Rose Building CLEVELAND, OHIO

eighteen months following the month of discharge by complying with the same conditions. Within three months following the month of discharge, reinstatement may be made by simply remitting two months' premiums without a formal application or statement as to health.

Reinstatement may also be made after eighteen months following discharge, as follows: If the insurance has not been lapsed longer than three months, by complying with the conditions outlined in (1) and (2) above. From the fourth to the eleventh month, inclusive, after lapse, by complying with the same conditions, and in addition submitting a formal report of examination made by a reputable physician

A Record of Nearly Twenty Years' Success in the Treatment of

Putrescent Pulps *and* Root Abscesses

More Than Ten Millions of Treatments Per Year

Ninety per cent. of cases, whether of long standing or acute, yield promptly to the bland and healing influence of Oxpara in the hands of the average dentist.

Registered in U.S. Patent Office
Prepared by E. W. Dodez, D.D.S., Fort Wayne, Ind.

Simple and Definite Technic — No Complicated Guess Work

Oxpara has brought the treatment of all forms of abscessed and putrescent pulps easily within the skill of every dentist, placing in his hands a safe, sane and sensible method of restoring diseased teeth to usefulness and preserving them in that condition for many years.

Oxpara is today, as for many years, the dependence of many thousands of able dentists, not only in America, where it is best known, but in every country in the world where modern dentistry is practiced.

For the Isolated Dentist

In districts remote from the activities of the research man and the specialist, Oxpara is truly a God-send, enabling the isolated dentist to preserve and restore millions of teeth that otherwise would necessarily be condemned to the forceps.

Since the introduction of Oxpara nearly twenty years ago, many so-called treatments have been devised, exploited, tested to the finish, and discarded, while Oxpara has gone steadily forward, constantly gaining in the confidence of the general practitioner.

Ask for Instructive Pamphlet

Price Unchanged Since its Introduction

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DETROIT AKRON

substantiating the statement of health to the satisfaction of the Director of the Bureau.

In announcing the new ruling, Director Cholmeley-Jones desires to emphasize the fact that War Risk (term) Insurance or U. S. Government (converted) Life Insurance may now be made payable to any of the following new and enlarged group of beneficiaries:

Life Insurance, now or at any time within five years after the formal termination. Parent, grandparent, step-parent, wife (or husband), child, step-child, adopted child, grandchild, brother, sister, half-brother, half-sister, brother through adoption, sister through adoption, step-brother, step-sister, parent through adoption, uncle, aunt, nephew, niece, brother-in-law, sister-in-law; persons who have stood in the relation of a parent to the insured for a period

The R & R *All Glass*
Syringe Sterilizer

2½ inches from top of Jar to top of Glass Rack.

4¾ inches from top of Glass Rack to bottom of Jar.

Provides Space for Two Syringes with Needles and Two Novocain Cups or Four Syringes

THE cover is ground to a perfect contact fit of the jar, having inside ledge and top shoulder, preventing evaporation and allowing easy removal; no trouble from sticking because of the glycerin.

The Glass Rack rests upon glass standards, cast in the jar, avoiding the use of metal.

The jar is filled to the required depth with a solution made of 50% alcohol, 15% glycerin and 35% R & R Sterilizing Solution (Schimmel Sodium Phenique). The syringes with chucks and needles attached are suspended in the solution deep enough to immerse the chuck.

The Glass Rack and contents may be lifted out as shown.

The care of a syringe will result uniformly in keeping the instrument in perfect working order.

Ask your Salesman about it

Price, complete, without Syringes and Cups	$5.00
Syringe Support for holding small Syringe	.35

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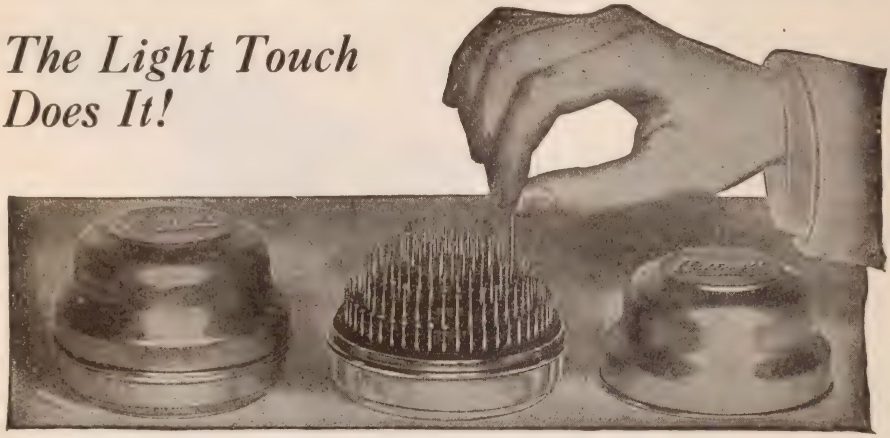
of one year or more prior to his enlistment or induction, or the child or children of such persons parent, grandparent, step-parent, or parent through adoption of the insured's wife (or husband).

War Risk (term) Insurance may be converted into United States Government Life Insurance, now or at any time within five years after the formal termination of the war by proclamation of the President.

United States Government (converted) Life Insurance, including Ordinary Life, Twenty Payment Life, Thirty Payment Life, Twenty Year Endowment, Thirty Year Endowment, and Endowment at Age 62, may now be paid in a lump sum at death, if such method of payment is designated by the insured.

The Light Touch Does It!



(Patent Granted December 22, 1914)

In addition to the regular half-dozen cartons, Cutwell Burs, are packed in assorted gross lots, in terraced revolving case (patented by us). The bur wanted is just under your finger always. NO CHARGE FOR THE CASE when supplied with one of our regular Assortments, made up as follows, based upon the requirements of the average dentist:

All assortments now contain half R. A. and half H. P. Burs

Assortment No. 1—7 dozen Plain Round, half and half; 5 dozen Plain Inverted Cone, half and half.

Assortment No. 2--6½ dozen Plain Round, half and half; 3 dozen Plain Inverted Cone, half and half. 2½ dozen Cross-cut Fissure, half and half.

Assortment No. 3—4 dozen Plain, half and half; 2 dozen Plain Inverted Cone, half and half. 6 dozen Cross-cut Fissure, half and half.

Assortment No. 1, $13.00 **Assortment No. 2, $13.50**
Assortment No. 3, $14.00

Empty Cases may be exchanged for a dozen burs, any style, if returned to us by mail.

Cutwell Burs, "specialize" in cutting tooth substance, and are ideal for that purpose; they will do that one thing better and with greater satisfaction to the dentist than any other bur made.

"The Bur with the Ten-ounce Touch"

Dentists who are constant users of Cutwell Burs find them a great aid to the attainment of "Painless Dentistry." Cutwell Burs *CUT*; they do not grind or scrape. Properly handled, they do not heat.

From your Dealer—Ask your Salesman

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FLINT
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THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL April 1920 No. 4

SHALL CERTAIN TYPES OF TEETH BE EXTRACTED OR RETAINED?*

BY J. P. HENAHAN, D.D.S., CLEVELAND, OHIO

WHILE THE SUBJECT of dental and oral foci of infection has been thoroughly discussed in our meetings and journals for several years, the idea, nevertheless, cannot be considered old. These terms, while conveying in many respects the same idea, still are not synonymous.

Oral foci may be regarded as meaning infected areas in the mouth, arising from the presence of filth-producing conditions, resulting from such contraptions as fixed saddle bridges, overlapping crowns and fillings, leaning molars, crowded incisors, pyorrhea, tartar accumulations, etc.

Dental foci refer to infections arising from the tooth and are regarded as meaning a dead tooth itself, because of its infected condition, or any of the pathologic conditions resulting from it, such as abscesses, granulomata or cysts.

Experiments with both types of infection have revealed the fact that each are equally dangerous to the health of the patient. Gastric and duodenal ulcers, arthritis in its various forms, heart lesions, infections of various types affecting the eye, all have been produced by these types of focal infection.

Although these facts have been proved to the satisfaction of many, it will take time to satisfy the majority that much of this is not theory, and that to extract teeth which show no symptoms in themselves is not going to extremes.

The profession cannot continue to regard the subject of extraction of certain types of teeth as a matter of controversy only, they must take one side or the other and they owe the public and the profession a report showing the results of their work. It will take years of effort to prove conclusively the virtue or vice of the various claims. Certain methods of root treatment which are now being advanced will need the test of time also to prove their worth. No method is of value in medicine unless proved. It may be said at present that every treatment and filling method applied to dead teeth in the past has been a failure. All teeth filled according to these methods, upon extraction show the presence of infection. These methods have undergone the test of years and have been found wanting.

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*This is the second of a series of articles on Extraction of Teeth as viewed from the position of The Twentieth Century Dentist.

The main contention upon which the retentionist bases his argument, when speaking in favor of dead teeth, is that theoretical difference supposed to exist between a pulpless and dead tooth. This idea will be exploded in due time, when experiments will fully show that the peridental membrane disappears as such from every devitalized tooth soon after the internal circulation is discontinued. It only remains for experiment to prove that in reality there is no difference between a pulpless and a dead tooth. Therefore, it is proper to ask the following questions.

Shall dead teeth be extracted or retained?

What conditions will justify their retention, and

What conditions shall dictate the removal of dead teeth?

Each man must answer these questions for himself and can only do so intelligently if his decisions are based upon either his own sufficient experience or the experience of others.

The questions which the dental diagnostician must answer when deciding to extract or retain a tooth are:

First, is the tooth infected?

Second, does the state of health of patient warrant its removal at this time?

Third, if you should make a mistake in your decision not to extract, how serious might the results be?

Fourth, from the viewpoint of the patient's interest, is it more important to retain the tooth or to sacrifice it and replace with a substitute?

In assuming the role of diagnostician and in answering these questions, the dentist is expected to be absolutely impartial, free from prejudice; with no motive other than to be absolutely honest, having only the welfare of the patient in mind and a sincere desire to reach the true conclusion.

First, in answering the first question, the answer is arrived at by consideration of the results found in numberless cases of dead teeth. Practically every such tooth shows the presence of some strain of streptoccocus, with other varieties of bacteria, a short time following devitalization.

Second, it is well known that thousands of patients with dead and infected teeth in their jaws suffer no apparent evidence of general infection, but it would be difficult to imagine how a symptomless tooth such as is shown in *Fig. 3*, could exist without being detrimental to health, yet this abscess was not in the early stages as large as it is here shown.

Young patients in full bloom of youth and glowing health, seldom are known to show symptoms of general infection supposed to arise in some constant focus of infection, and if nothing of an exceptional nature develops to injure the health, the dental focal infection may for years continue without really affecting the general health, for the simple but important reason that the vigorous body has set up an immunity to this particular infection. In a case of this kind it would seem the reasonable procedure, if consulted, to inform the patient of the possibilities, because the patient forewarned is forearmed.

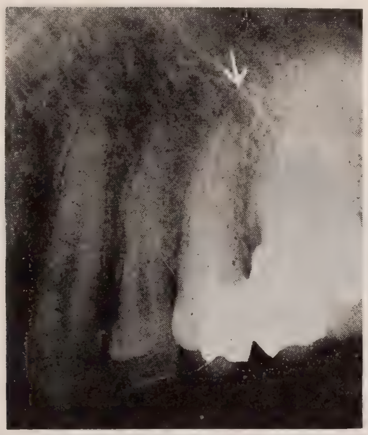

Fig. 1—Radiograph of bicuspid devitalized and filled several years ago. Picture shows very little apparent pathology. No symptoms were present.

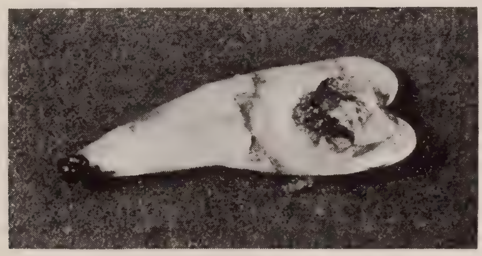

Fig. 2—Photograph of tooth in Fig. 1, after extraction, showing granuloma. Bacteriological examination showed presence of streptococcus veridans.

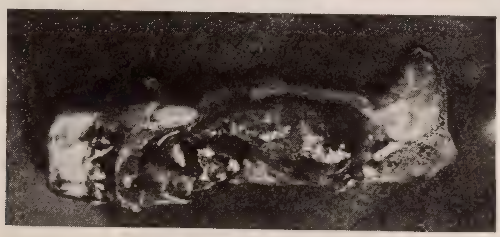

Fig. 3—Tooth treated and crowned several years ago. No local symptoms whatever were present during the time. Patient has been anemic and lethargic. Gained noticeably in health and weight in a few weeks following removal.

However, although the preceding is true, danger always lurks in any focal infection. As time goes on, a tendency develops to lose the established immunity until after passing the age of forty years, many patients begin to show effects from these conditions which during earlier and stronger years could be ignored. It is impossible at any period of life to form an opinion as to when the secondary foci or other morbid conditions begin to develop.

It also has been shown that such constant foci become more dangerous when some other infection, such as influenza, invades the body. At this time, due to the general weakened condition of the body, the long established immunity of the body is lost and that infected tooth may, if not removed, complete the baleful work the influenza began.

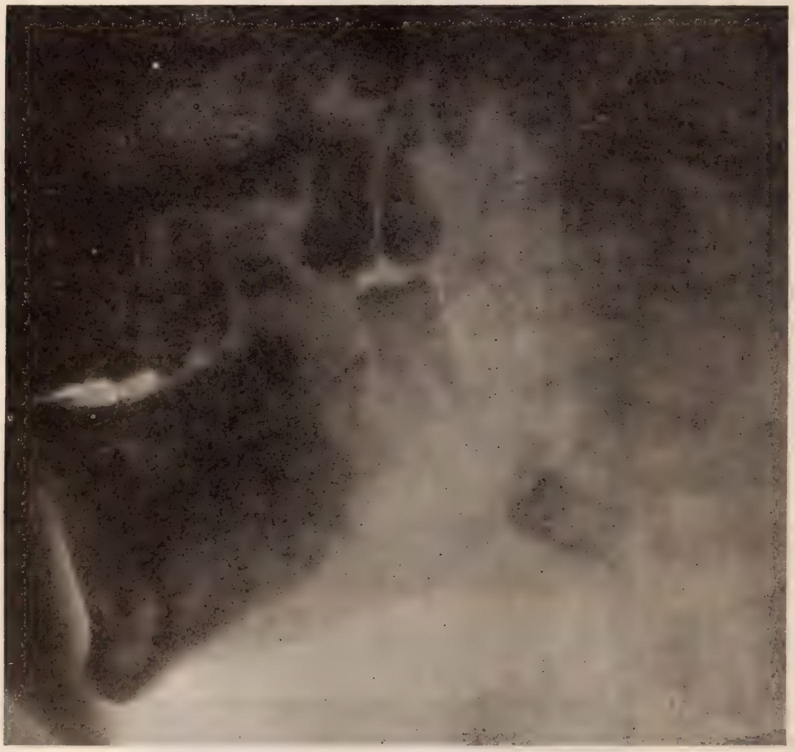

Fig. 4—Case of boy 20, returned soldier. Six-year molar filled five years previous. Cyst developed during that time, without causing symptoms. Jaw almost divided. Note third molar lying in bottom of cyst and twelve-year molar suspended in small fragment of bone.

Third, this is a question which should be weighed carefully. In order that it may be properly considered, let one imagine the patient to be his own son or brother, and the age eleven years. He is first confronted by that fact always of great importance to a dentist, the youthful patient is liable to lose a tooth. His every instinct as a dentist prompts him to prevent this, but now comes the time for careful consideration, not only of the condition and possibilities as they confront us today, but for each of the succeeding years. Is the tooth already infected? If so, is it safe to retain this infection and chance the results upon general growth and development of body and intellect? Will it attack the eyes of the growing patient, or the heart, or the lungs, or the joints; and, for the sake of a tooth, are we justified in jeopardizing the chances of life, health and happiness of the patient? We will not make hasty decisions if we fully consider the importance of our decisions to the patient. At any rate, if these interests of the patient are to be gambled, let the patient himself take the chances with full knowledge.

Fourth, if no substitutes at all were possible, there would still exist the same reason for the correct diagnosis and, in my opinion, when the proper time arrives any proven dead teeth should be removed.

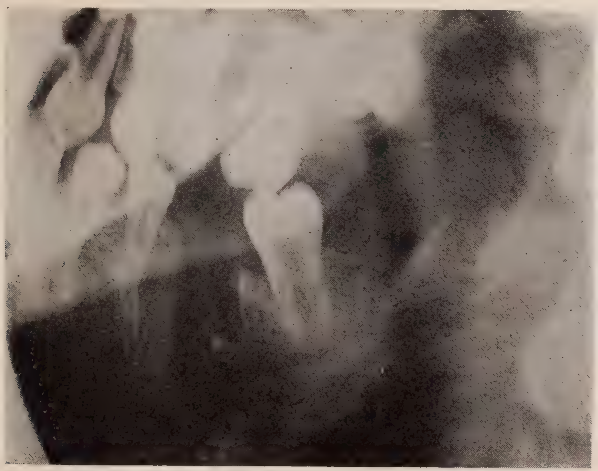

Fig. 5

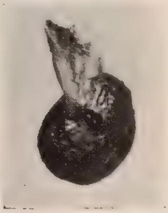

Fig. 6

Fig. 5—Case of boy 14 years old, showing resorption of bone, due to abscess formed on root of six-year molar which never had been filled.

Fig. 6—One root of six-year molar removed, as shown in Fig. 5.

It is not the intention of the writer to convey the impression that on all occasions dead teeth should be extracted, whether or not any other compelling reason exists.

Thousands of patients are carrying dead teeth around in their jaws and show absolutely no impairment in health. In cases of this kind your advice to remove would not be accepted with much enthusiasm. It is only when patients present who are complaining of some morbid condition, the cause of which cannot be located elsewhere, that the dental or oral focus of infection in the form of a symptomless, dead tooth should enter as an object of suspicion.

The dentist of today is, by virtue of his opportunities, called upon to render more scientific service to humanity. He must put dentistry upon a more practical as well as more scientific basis. He is not justified today in any case in devitalizing a tooth, because he is creating that which tomorrow will be regarded as a source of infection.

Dr. Mayo has said that the next great step in preventive medicine must come from the dental profession. If the dentist is to measure up to the standard which has been set for him, he must forget much that was regarded as good practice yesterday, and help with all his might to correct, as far as possible, the mistakes which already have been made.

Approximately thirty years ago, root-canal treatment and filling became popular. Before that for many years root-canal treatment had been resorted to to some extent with varying measures of success, but the great majority of practitioners of dentistry were very liable to advise the removal of any tooth with an exposed or putrescent pulp, if pain attended these conditions.

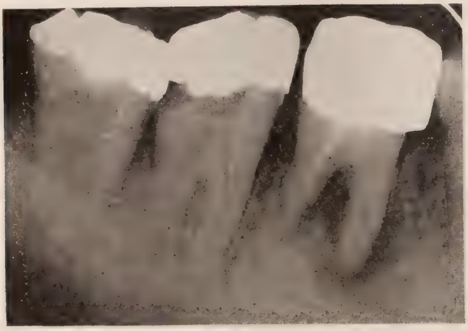

Fig. 7

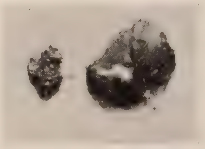

Fig. 8

Fig. 7—Case of long-standing infection which was responsible for severe case of iritis. which subsided following extraction, but returned in ten days.

Fig. 8—Granuloma removed two weeks following extraction of tooth in Fig. 7, Iritis subsided in 24 hours and has not returned.

With the advent of this intensive treatment and the remedies which it comprised, odontalgia easily was controlled. Arsenous acid, an ancient toothache remedy, took on added importance and was resorted to with increasing frequency as a devitalizing agent; since then pain has been a very insignificant factor as a cause for the removal of teeth. Today, where one tooth is removed because of the pain it is causing, thousands are removed for other reasons.

This entire question regarding dead teeth exists because the tooth occupies a peculiar position in the catagory of tissues. No other organ or tissue can lose its vitality and be retained. Nature manages in some way to quickly eliminate it.

The reason for this peculiar fact is not that nature is more tolerant of a dead tooth than of any other dead tissue, but because of the mechanical arrangement of the tissues supporting the tooth and the shape of the tooth itself, conditions which make almost impossible every effort of nature to exfoliate the dead thing.

In either jaw the tooth with one, two or three roots, approximately two-thirds of an inch in length, extends into a snug bony socket. Besides the tooth, this socket contains only a very thin membrane. In the first stage of inflammation the tooth protrudes from the socket, constituting nature's first effort to cast off that infected thing which irritates her. Promptly the opposite jaw closes, the tooth is forced back in, nature's efforts are undone, and more irritation set up.

Nature, after a time, tires of her efforts to rid herself of the tooth in this way and sets herself patiently to work to protect herself by other, sometimes slower and sometimes more radical methods. As time goes on the evidence of existing infection is shown by the formation of those pathologic conditions with which we are all familiar, such as apical abscesses, granulomata or cysts, and especially often are those conditions noted in teeth which have undergone dental treatment.

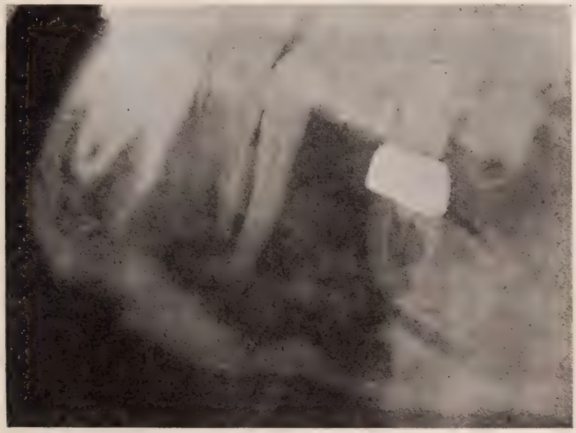

Fig. 9—Case of symptomless dead molar, which was the cause of extensive osteomyelitis.

The more radical measures are characterized by rapid destruction of the supporting bone; sometimes we see suppuration followed quickly by sequestration of large areas of bone including the alveolus and tooth.

The more dangerous condition develops in connection with the slowly-developing granuloma, which sometimes sends its tentacles ramifying through the cancellous structure of the bone, until such time when, due to development of accute symptoms, osteomyelitis develops, resulting in the destruction of great areas of bone and loss of a number, or possibly all of the teeth and jaw.

Herodotus in 460 B. C., wrote that the diseased teeth have an influence upon diseases of the breast, throat and ears, and that such conditions could be cured only after removal of troubling teeth. His auditors probably proclaimed him a radical. His statements probably were based upon observation; the statements of his critics based upon nothing, just as they are today.

The X-ray has become a fixture as an adjunct to dental practice and is becoming more and more widely employed. The use of this medium of diagnosis is absolutely necessary to intelligent conclusions.

The question of extraction of dead teeth always stirs up a storm of comment, but as yet not much has resulted to prevent the devitalization of many teeth which could, with proper treatment, be restored without devitalization.

Years ago the older practitioners were very much occupied in the question of pulp capping, and many operations for this purpose were entirely successful, leaving the tooth efficient in every respect. The development of the idea ended with the activities of the older generation of students and the acceptance of the devitalization theory.

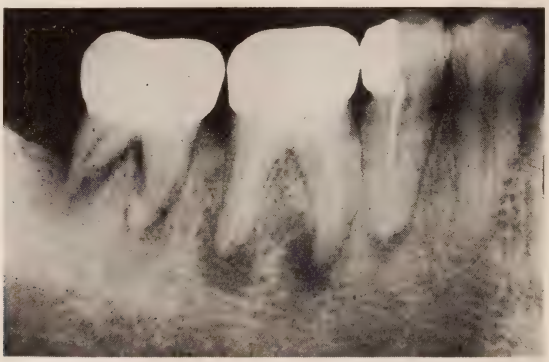

Fig. 10—Crowned molars entirely symptomless, showing resorption of roots and regeneration of bone following. The question could be asked who will assume responsibility for the innocence of this tooth during the time these changes were taking place.

It seems as though the profession, if they are to accomplish anything really worth while in the saving of teeth, will have to forget those teeth already dead, their new root-canal fillings, etc., and develop a method of treatment and filling which will insure the continued vitality of the tooth. If there is anything to the claims that by new methods complete sterilization can be attained, why not combine the idea with extraction and replantation? Thereby not only ridding the tooth, if only for the time being, of all living infection, but also the socket during the time tooth was out.

The greatest obstacle in the path of advancement which now confronts the dental profession is the one which will be the hardest to overcome. Prejudice. This human vice has manifested itself constantly to the detriment of medical advancement in all ages. For centuries it was impossible for any one succeeding Hippocrates (who was regarded as the Father of Medicine) to gain the ear of the profession or the public, if he attempted to propose or advance any idea which in any way conflicted with accepted teachings. During these centuries some men even were punished by death for fostering ideas which since then have been found good.

Vaccination against small-pox, a disease which periodically scourged all nations, was bitterly opposed, but the merit of the idea is evident in the fact that small-pox has all but disappeared from the earth.

An unbaised viewpoint is the only position for a sensible dental or medical diagnostician to take. The greatest trouble with many dentists today, when viewing a case, is that they take sides and are influenced by prejudice. In the face of such a situation the public must suffer.

The dentist is not supposed to take sides; he is only called upon to analyze the situation for the patient, something his education and training enables him to do. His position should parallel that of a judge charging the jury, carefully summarizing the evidence from both sides. He need not make positive claims that this or that is so; he simply shows the patient, constituting the jury, that in many cases such and such has resulted following such and such a procedure.

No wise medical man guarantees certain results. He only advises according to the lines which his experience has led him to believe to be correct. He knows also that one man's medicine is another man's poison, and does not advise the same in all cases.

When the physician and dentist will thoroughly understand the spirit which actuates the research worker in medicine, understands that cooperation is sought, for the benefit of suffering humanity, when he gives it rather than causeless opposition; then shall we see our most noticeable progress.

We need not fear a senseless campaign of extraction, including even good teeth, if each of us will but realize that after all, most men are as sensible and even as conservative as ourselves. The greatest mistake will result if the majority lack initiative and are radical even to the extent that they will not extract teeth which should be extracted.

Rose Building

To Protect the Handpiece from Moisture

Soft rubber polishing cups, size A or B, placed on a bur, polishing brush, or stone, will fit over the nose of the handpiece and prevent grit or saliva from working into the mechanism of the instrument.

—*George A. Randolph, Dental Facts.*

EXOLEVERS, FORMERLY TERMED ELEVATORS*

BY D. P. SNYDER, D.D.S., EXODONTIST, COLUMBUS, OHIO
INSTRUCTOR OF EXODONTIA, OHIO STATE UNIVERSITY

THE EXOLEVER is an instrument designed for a definite purpose; that is, lifting out a tooth or root from its supporting tissue by a given technic, taking the place of the instrument termed "elevator," which is designed and manufactured indiscriminately with no definite purpose. The Exolever will aid and assist the dentist in choosing a definite set of instruments to meet his demands, and enable him to use them as the designer has intended.

In the past, the dentist has designed and placed in the manufacturers' hands many instruments to meet his particular method of operating, until there are all shapes and kinds on the market, and one is at a loss just what to buy and how correctly to use them.

At every opportunity the dentist purchases a new instrument, with no instructions whatever, tries it out, fractures the tooth, lacerates the patient's jaw, oftentimes his own hands, finally becomes disgusted and reaches for his old reliable forceps and attempts to remove the tooth; and if he succeeds with it whereas he failed with an instrument sold him to take out any root, no matter how used, how can you expect him to be a user of even the best instruments if used as the designer intended?

In times past, an operator was considered to have done his duty as an extractor if he succeeded in removing the tooth. It mattered not, if in so doing he caused extensive destruction of the surrounding tissue nor did it matter how much time was consumed in the operation.

From the lack of proper training and of instruments suitable for the removal of broken-off roots, many infected ones are left undisturbed to discharge their toxins into the blood stream, the dentist frequently remarking, "they will work out."

These roots may become loose in the socket, but once infected they remain so. The radiograph furnishes evidence of the destructive process of these infected roots, showing large areas of necrosis. This is proof enough that all infected tissue should be removed.

The Exolever, being a suitable instrument, enables the dentist to remove teeth or roots without lacerating soft tissue, or crushing or fracturing hard structure. Conservation of tissue always should be uppermost in the operator's mind.

Times have changed, and operations for the removal of teeth should be of such character that the tooth will not only be extracted in the shortest possible time, but that its removal be attended with little contusion or destruction of tissue.

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*One of a series of Articles from Dental College Teachers, written exclusively for THE DENTAL SUMMARY.

It is desirable to shorten the operation as much as possible in order to lessen the traumatic trouble, and also decrease the length of time necessary for anesthesia. When a general anesthetic is used the danger to the patient is lessened, as is also the cost of the anesthetic if the time of operation is shortened. The patient never should be under an anesthetic longer than necessary, and by improving the technic of operating, the patient is under the anesthetic the shortest possible time.

Where indicated, the Exolever is the best extraction instrument. The application is easier and more quickly made and results are more sure than with the forceps, causing less destruction of the surrounding tissue; also it can be used with less apprehension. You have a clear view of the operating field and tooth movement can be observed, and any change of position or line of force can be made quickly. It can be used where there is not sufficient space to exert tractile movement with the forceps. This instrument acts on the principle of a lever, wedge, or inclined plane.

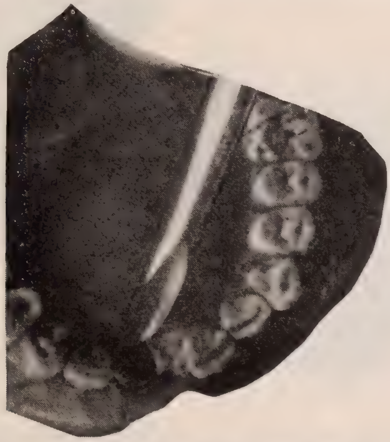

Fig. 1—The straight Exolever in position, showing the first application of this instrument in the extraction of an upper central root.

Its use is indicated in all broken-down teeth or roots, wedged or impacted teeth, and in all other cases where the forceps can not readily be applied, and the extraction movements carried out.

The essential forms are not numerous, and are preferred to a large number improperly chosen. In my opinion five Exolevers, if properly chosen will take care of the average case if used correctly; therefore, I will confine my description and illustration to these five.

The Exolevers always should be kept sharp so that they will cut through and not condense the process or cause contusion of the gum at the point of application. A clean cut will heal or repair itself more quickly than a contusion. Also, the tooth or root in most cases must be engaged and it is necessary that the instrument be sharp.

For upper single-rooted teeth and separated roots of molars, the simplest form is used. (*Fig. 1*). The blade is a continuation of the shank and bent slightly, convex on one surface, concave on the other, tapers to a thin oval point and conforms to root form.

The handle is all metal, hexagonal in shape, with rounding and smooth end to fit the palm. The shank should be fitted in the ferrule of the handle and soldered with silver solder. This instrument is sometimes imitated and soft solder is used.

This instrument is used almost entirely by applying force in line with the long axis of same. It is operated as a wedge with a slightly prying, rotating motion. Great care must be used with this instrument in the region of the antrum.

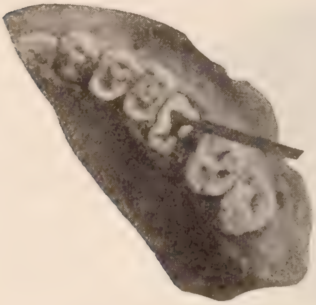

Fig. 2

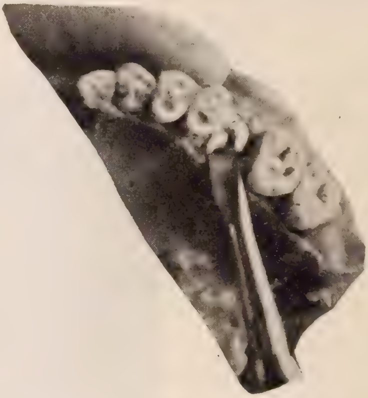

Fig. 3

Fig. 2—Showing the first step in separating an upper molar tooth that has been fractured with the forceps.

Fig. 3—Completing the separating of roots with the Exolever and application to remove one of the roots.

For broken-down, upper third molars, the Knott type with which most dentists are familiar, should be used. Its position is on the buccal or lingual between the root and the mesial process, forcing the instrument well down and engaging the root with the sharp point, and applying the force in a downward, backward direction. Lateral force must not be used as it may fracture the tuberosity.

Where the crown is fractured in extracting the upper molars, in my opinion, the forceps have no further use in this extraction. This fracture is generally at, or cervical to, the pulp chamber. The bur should be used separating these roots and the extraction carried out the same as single roots. (*Figs. 2 and 3*).

In the lower jaw, extraction is more difficult, due to the density of the buccal plate, the mobility of the mandible and the dangers of injuring the soft tissue of the mouth.

With the exception of the impaction, in my opinion, the lower first molar presents many difficulties in extracting; therefore great care should be taken, as in many cases these teeth have been devitalized at an early age, having become dehydrated, and have a tendency to cleave or fracture under pressure of the forceps. Also many of these teeth have hypercementosed roots and oftentimes the buccal plate is very dense, probably due to condensed osteitis.

When the operator is aware of these conditions the difficulty of the extraction may be lessened by removing a part of the buccal plate by a bur or ossisector. When fractures occur the first step is to separate the roots either with the bur or Exolever; then the case is comparatively simple. A sharp spear-shaped Exolever is forced through the buccal plate and between the roots engaging the distal root, it being the straighter and easier to extract, after which an Exolever is applied in this socket and forced through the septa until the point engages the mesial root. (*Figs. 4 and 5*).

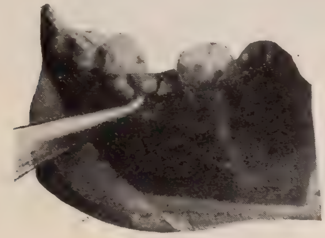

Fig. 4

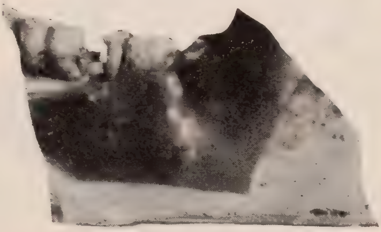

Fig. 5

Fig. 4—The spear-shaped Exolever is forced through the buccal plate and between the roots, separating the teeth and engaging the distal root.

Fig. 5—Showing the removal of the distal root. Being the straighter, it is easier to extract.

The lower bicuspid also presents many difficulties when it is dehydrated or badly broken down. It usually is crowned more or less in the arch and frequently has hypercementosed roots. On account of the mesio-distal diameter being less than the bucco-lingual diameter the tooth is very easy to fracture, which usually occurs below the margin of the process, and an attempt to grasp it with the forceps usually results in the loss of the lingual plate and injury of the soft tissue of the mouth. (*Fig. 9*). A sharp spear-shaped Exolever is forced well down through the buccal plate, engaging the root, and by prying upward the root is forced out unless it is hypercementosed, and in this case if the socket will not permit of its passage it will be necessary to enlarge the socket. (*Fig. 10*). In forcing this sharp instrument through the gum tissue and process, less injury is done.

The spear-shaped Exolever should be concave on one side and convex on the other. The sides should be sharp and converge to a point. It should fit the palm readily as great pressure is needed in cutting through process or wedging between tooth and process. This instrument may be used in nearly all cases of roots in the lower jaw.

Another Exolever of the same shaped blade, but set about a forty-five degree to the shaft is used in the posterior part of the mouth. This instrument is very valuable in lifting out lower third molars as it can be placed under the crown of this tooth when tilted mesially, as in *Fig. 11.* It also is used on broken-off lower molars when these teeth are isolated, by wedging it between the tooth and process at the mesio-buccal angle.

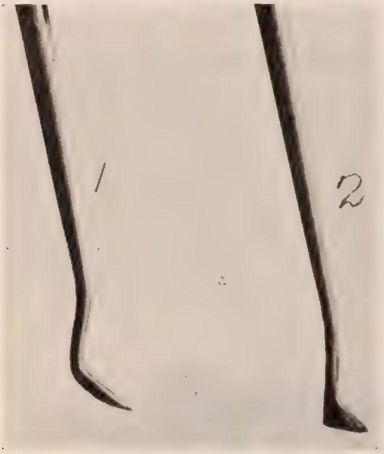

Fig. 6

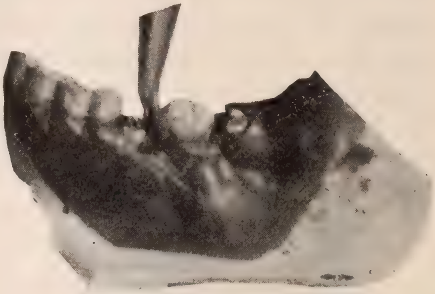

Fig. 7

Fig. 6—Instruments Nos. 1 and 2 are used in the socket of the distal root, cutting through the septa and engaging the mesial root. No. 1 is an improvement over No. 2, in that we can go further into the socket and secure apical thirds much better than with No. 2.

Fig. 7—Exolever in position for the extraction of the mesial root.

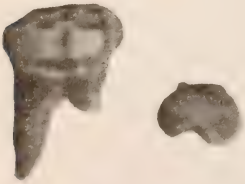

Fig. 8

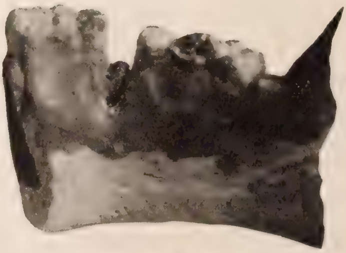

Fig. 9

Fig. 8—The most frequent place of fracture of this tooth, due to the distal curvature of the mesial root.

Fig. 9—Usually the result of alveolar forceps in an attempt at the extraction of the lower bicuspid when broken off at the margin of the process.

The adjacent teeth never should be used as a fulcrum in any case. How useless it is to try to force an instrument between the teeth, then apply leverage and expect the root to come out! Leverage thus used only forces the root firmer in the socket.

The technic herein described will take care of the remainder of the lower teeth or roots.

There is no set rule governing the technic of impacted and malposed teeth. Radiographs should be obtained of impacted teeth, especially of complete impaction; the cause of the impaction should be studied. Note the size of the crown, position of the roots and their curvatures and the amount of bone tissue over them.

To minimize traumatic injury, Dr. Winter has designed several instruments, termed ossisectors, these being used to cut away bone tissue in impacted cases and the constricted process around the necks of teeth, also to break up fusion with the process. These are used with hand pressure and better controlled than when the mallet is used. The blade is beveled making it easy to remove clean chips of process.

Where the forceps can be applied readily and the tissues and jaws will permit of their free action, where the extraction movements will not be hindered, there is no better instrument to my knowledge. Forceps have been promiscuously designed and manufactured, and only in recent years has there been an attempt to standardize them. This instrument has broad flat handles, swell ends and rounding joints and should fit the teeth for which they are intended.

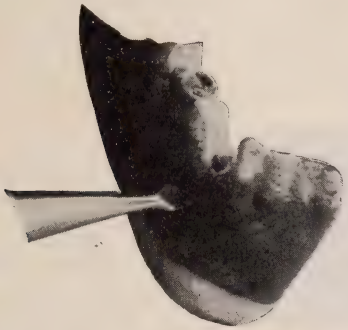

Fig. 10

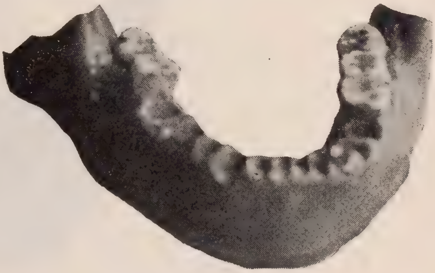

Fig. 11

Fig. 10—Less destruction of tissue by forcing a sharp spear-shaped Exolever well down through the buccal plate and engaging the root.

Fig. 11—Tilting third molars where the extraction movements can not be carried out with the forceps. These should be removed with an Exolever.

"Readily applied," is meant where the forceps can be placed on a tooth or root in a direct line with their axis without contusion to the gum tissue, and the extraction movement carried on in line with the axis of the tooth. If the jaws do not permit of this free application of the forceps, and you cannot with any degree of accuracy use free extraction movements, then the forceps are not indicated in this case.

How may heartaches and cuss words could be saved if the dentist would stop and study his cases, especially in the extraction of third molars. My experience has taught me that fully ninety per cent. of the lower thirds, and more than fifty per cent. of the uppers have a decided curve distally.

The extraction movements of the lower third molar should be upward, backward and inward if the tooth is in proper alignment; that of the upper should be downward, backward and outward. How can we successfully carry on extraction movements with the forceps? We will take it for granted that the general opinion of the extraction of the upper third molars in the majority of cases is quite simple, this being due to the cancellous structure surrounding it, and the head being held firm in the headrest, force can be applied.

It has been the rule rather than the exception that the patient expects pain, torture, and post-operative pain with the extraction of teeth, until we find fifty per cent. of our patients harboring old broken-down roots in their mouths, making a filthy screen for pure, clean food to pass, that has cost money and time to prepare, only to be contaminated many more times by these sacred old snags, that they worry and look to the day of agony to have them removed. It was common practice to fill and bridge teeth and the last thing brush and have that old snag taken out, and then we were all through.

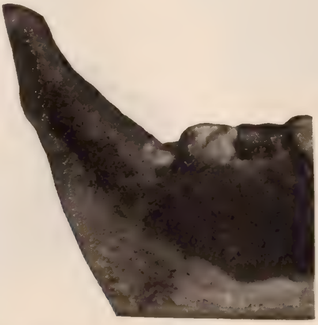

Fig. 12—A third molar retarded from its normal position by a dense ledge of bone over its disto-occusal surface. This type very frequently is broken off with the forceps.

The dentist who expects his toils to show results today, tells his patient that we must first clean house. We will rid his mouth of these useless roots, scale and polish his teeth, and then we will restore them with fillings or bridge work. And at the same time the dentist enjoys working for that patient because he has a clean mouth and the fear of the last appointment has gone. The patient already has expressed himself as to how much better his mouth feels or how he is improving in health, and he looks forward to the day when the dentist will have finished his work rather than fear that last appointment which he oftentimes will break, and not return until forced through pain. Otherwise the dentist must round him up for settlement for work previously done, and he still has that sacred old snag.

137 E. State St.

A COMBINATION OF THE MODERN METHODS OF IMPRESSION TAKING*

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"DOCTOR, I don't suppose a person with a flat mouth like mine can ever expect to have plates that will stay up, can he?"

Every dentist is more or less frequently approached with some such query as the above, and it would be interesting statistics to record the number of dentists who look at a mouth with flat ridges and declare: "I'm afraid not. Keep your own teeth as long as you can because you'll never be able to wear a plate." A record of the same men probably would show that they are operators of ability in other phases of dentistry, such as gold and amalgam restorations, where the principles of cavity preparation are so fully recognized that the fillings are properly anchored, or in the construction of gold crowns which possess full anatomical value and are held in place a lifetime by the use of a good cement, or in the case of partial dentures which are held in position and which serve their purpose because a tooth or two still remains to "tie to." But when all of the teeth are lost many a dentist is lost. His sense of right principles of procedure which made his operative work a great success, apparently fails to serve him in dealing with an edentulous mouth. Force continues to emanate at right angles to its source; the parallelogram of forces still obtains in the physical world; structural engineers persistently use flat seats for foundations—why should the dentist, confronted by flat ridges, not accommodate himself to the eternal fitness of things prosthetic, instead of casting about for a peculiar technic or procedure which ignores the real principles involved?

Successful methods of impression taking recognize some very definite physical laws. Recognizing these laws, a special kind of material is not so indispensable as was once thought; beeswax, in the hands of an operator who knows exactly the results he is seeking, will serve more acceptably than any patent compound, plaster, tray, heater, etc., in the hands of one who is ignorant of, or who ignores, the principles involved. In our prosthetic bible, chapter two, on Impressions, third edition, page 56, (Wilson) is a favorite text of ours: "There is no legerdemain associated with prosthesis, the profession being only an expression of cause and effect."

The methods most familiar to the dentist are the Wilson, the Green, and the Hall. An expert in any one of the methods will secure as good results as another expert employing one of the others. The writer has combined the more acceptable elements of the three methods and secures better results in his own practice through stressing now one phase and now another, according to the conditions presenting in an individual case. He has found also that for instructional purposes certain elements of one method lend themselves to better advantage in demonstrating the principles involved in impression taking; further, it has been his experience that beginners in the mastery of modern scientific impression taking more quickly learn to embody fundamental principles, if they are given liberty in the choice of materials and methods.

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*This is the fourth of a series of twelve articles being written by Dr. Campbell, for the 1920 volume DENTAL SUMMARY.

Three requisites of a good impression in the order of their importance are areal contact, peripheral adaptation, and extension upon the soft tissues. In emphasizing areal contact, the writer emphasizes the desirability of covering as much of the ridge, either upper or lower, and of the surrounding tissue as the case will permit. Peripheral adaptation applies to adaptation along the border of the impression, where some practitioners once were accustomed to scrape the cast, as indicated in *Fig. 1*, in order to assure a closer contact. The writer is suggesting in this article a method by which the guess-work of those practitioners may be eliminated. In stressing "extension upon the soft tissues" reference is made to soft tissues wherever involved, but primary emphasis is laid upon extending the impression over the soft tissue posterior to the hard palate, because this may serve as a valve seat or seal and when employed will take advantage of atmospheric pressure. To secure *compression* of the soft tissue at the juncture of the hard and soft palates without *depressing* the soft palate requires skill and is perhaps as difficult as it is desirable.

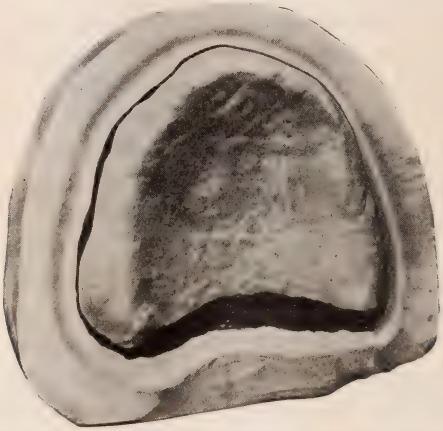

Fig. 1—The black line indicates the portion of the cast which some operators once were accustomed to scrape in order to assure a closer contact.

In taking an impression it is perfectly obvious that the more closely the impression tray is adapted, the less manipulation of impression material will be required in order to get the desired results. On this account the writer prefers to use the Hall black impression tray material manufactured by S. S. White.

In the use of this material, a Britannia metal tray, No. 1, 2, or 3 upper, or No. 1, 2, or 3 lower will meet the requirement. Choose a suitable one of these and place a mass of the compound in the upper tray; smooth out over the surface of the tray and take an impression as one is accustomed to do with ordinary modeling compound. Two cakes of this tray material is sufficient for an upper, while a cake and a half will suffice for a lower. Place it in water just a little hotter than the fingers can comfortably bear, and when pliable remove and knead sufficiently to have the mass assume approximately the shape of the tray, always folding the edges under and thus keeping the surface free of wrinkles. The habit of kneading this compound and returning to the hot water repeatedly is a useless habit; nothing is gained by the repetition because the cakes are manufactured thin so as to absorb the heat quickly. The first time that the material is taken from the water it may be formed to the tray and the preliminary impression taken.

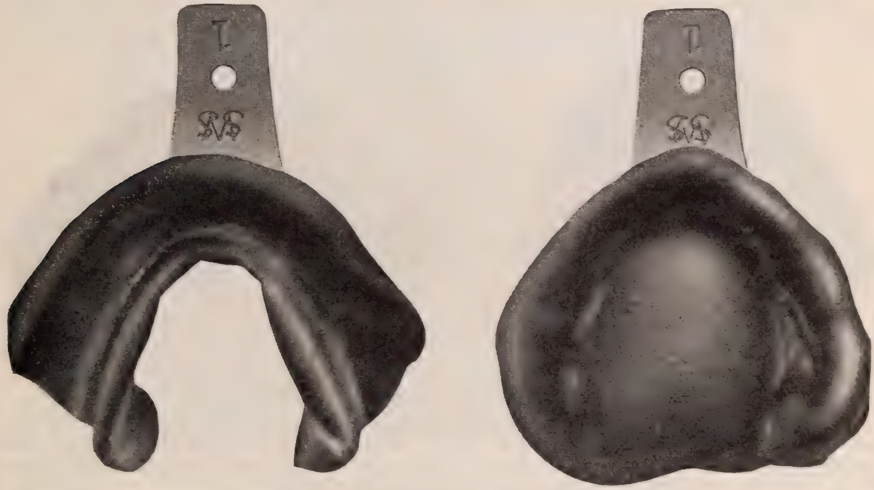

Fig. 2—Upper and lower impressions as they look immediately after removing from the mouth.

With the patient seated at the lowest possible position of the chair, the tray is brought up into place, keeping the handle of the tray directly in the median line. As the tray is brought into position with both hands, one is released in order to use the mouth mirror for the purpose of pulling forward the excess material that will otherwise be slowly moving towards the throat. Care should be taken to avoid applying so much pressure that the resulting impression will be very thin; some "body" is very helpful in avoiding fracture and may be augmented by selecting a larger tray than is absolutely necessary for the case. The material may be held in position two or three minutes or it may be chilled and removed immediately. *Fig. 2* shows both upper and lower as they come from the mouth. After the overlapping edges have been *broken* away (cutting them away usually scars the metal tray so that upon subsequent occasions the tray is removed with increasing difficulty), the compound is removed in the shape of an individual impression tray.

This individual black compound impression tray at this stage extends too far upon the buccal and labial tissues, and in all probability compresses to a greater degree than is desirable the tissue just back of the tuberosities. If the mouth is of that type which has a soft flabby ridge of gum tissue in the region formerly occupied by the six anterior teeth, this also will be compressed to a greater degree than can be borne with comfort in the finished denture. The tray is corrected in the following manner:

Using the small blade of a very sharp pocketknife, because the ordinary laboratory knife is too unwieldy, clumsy and dull, the tray is cut to size and contour. The cutting is done at right angles to the occlusal plane; there is no occasion for cutting the buccal and labial borders of the tray in any direction except vertically to the median line. The buccal portion is trimmed away to a point which may be described as "the crest of the buccal or labial roll." *Fig. 3* shows the edge to which one side is trimmed; the other side has been left untouched.

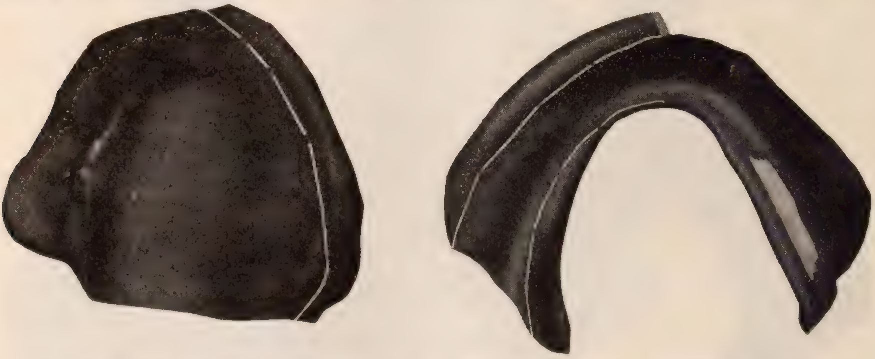

Fig. 3—Upper and lower compound impressions, showing results of trimming to shape for use as individual trays. The white thread lines indicate limits to which trimming is continued. The whitened spot on the lower indicates the portion that should be cut out so as to avoid pressure upon the mylohyoid ridge.

When this tray has been trimmed in the fashion just described, an expert could proceed with it to take the final impression. The novice, however, will find that it is much easier to use Kerr's Stick Modeling Compound at this stage as an aid in further trimming the tray to a more desirable shape. This further trimming follows the technic which Dr. Greene outlined many years ago, when he instructed the patient to move the lips and cheeks in grimaces and contortions that served to lower the border of the tray at points where the tissues impinged upon it. The writer prefers to depart from the instructions which Dr. Greene was accustomed to give his patients; the departure is on account of reasons psychological which will be discussed more fully in a later article of this series.

A stick of the Kerr Compound is heated in the flame and then penciled upon the portion of the tray extending above and back of the impression of the tuberosity and as far forward as the buccal frenum. This is penciled on the tray to form a slight layer along the inner border; this layer is heated slightly in the flame, held for a moment or two near the operator's cheek in order to re-assure the patient, and the tray placed in the mouth and pressed up to position with the fingers of the right hand, while the left is employed to trim the border. The left hand is employed for this purpose by inserting the last three fingers into the mouth and grasping between them and the fleshy portion of the hand at the base of the thumb the lip and cheek, and pulling downwards and pressing inwardly; or in the case of small mouths, the first two or three fingers of the left hand pressing down and inward may be employed from the outside as shown in *Fig. 4*. The other side is penciled likewise and treated in a similar manner. Then the portion between the buccal and labial frenums is dealt with after the same fashion.

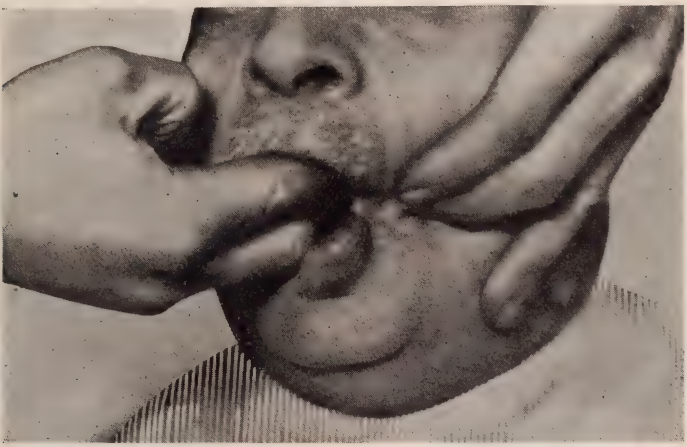

Fig. 4—In trimming the border with the use of Kerr's modeling compound, two fingers of the left hand may be employed, pressing down and inward from the outside.

Readers will note that, for ease of manipulation, the penciling process concerns itself with four sections consecutively: (1) Right upper, from tuberosity to buccal frenum; (2) Left upper, from tuberosity to buccal frenum; (3) From buccal frenum to labial frenum on right side; (4) From buccal frenum to labial frenum on left side. Often the operator will find that after these four operations, slight imperfections may be corrected through re-tracing the compound over small portions, or through using a small flame from a Bunsen burner or a spirit lamp projected with a chip blower. In each instance the tray is returned to the mouth to mold the border after the technic described above.

Before penciling the compound across the posterior border of the tray at the juncture of the hard and soft palates, a hole slightly smaller than a lead pencil is drilled through this individual tray in the median line immediately posterior to the labial ridge. The entire inner surface of the center of the tray is cut away in order to leave ample room for the plaster. In the case of a soft, flabby ridge which, as mentioned above, will have been too greatly compressed, the tray is cut out freely here to correspond, so that when the impression is taken the flabby tissue will hang pendant in the plaster. *Fig. 5* shows the upper and lower after completion of the penciling process.

The next step utilizes the Wilson method of compressing the tissues. Compression of the soft tissues usually has been a bugaboo to the dentist, because of the difficulty of determining the proper temperature of the Kerr's Compound for this purpose; if the compound is too warm, it flattens out without compressing the tissues; if it is not warm enough the compound rides upon the harder tissues and leaves the area to be compressed practically unaffected. Instead of using beeswax as Dr. Wilson is accustomed to do in lining the Britannia metal tray, the writer prefers to use in connection with the individual black compound impression tray a softer material than beeswax, namely, the black wax upon which the teeth are carded by the manufacturers. A portion of this wax is kneaded into a pencil and reduced to a diameter a little larger than the shank of a bur, when it may be pressed lightly against the inner portion of the individual tray, which has been thoroughly dried. The line along which this roll of black card wax should adhere, corresponds to the line on the cast indicated in a previous figure as the portion which older practitioners were accustomed to scrape. *Fig. 6* shows the wax roll in place. The tray is now inserted, with the operator standing directly behind the patient, with the head held firmly in a headrest,

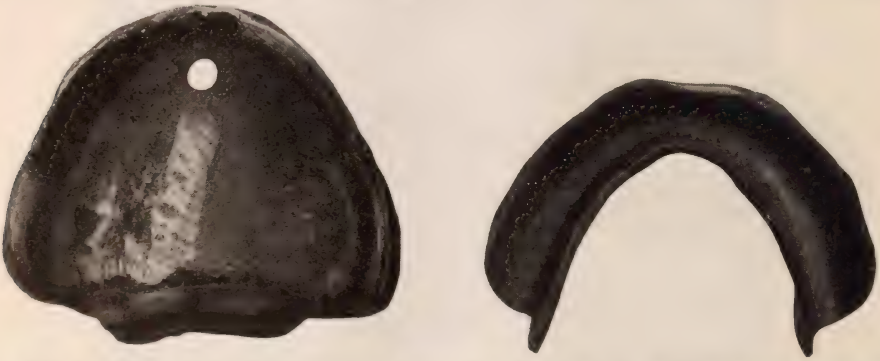

Fig. 5—Showing black impression trays after Kerr's stick modeling compound has been penciled upon them, and the borders of which through repeated returns to the mouth have been molded as desired.

two fingers of one hand on one side of the base of the tray and two fingers of the other hand on the other side of the base, it is pressed to place, gently at first but increasing the pressure as the warmth of the mouth softens the black wax. In most mouths as much pressure is exerted finally (toward the conclusion of the operation) as the dentist is able to exert. The operation will extend over a period of a minute, but unless the dentist times the process by his watch, he likely will be finished within twenty seconds.

As a result of the precaution taken in drilling a hole in the median line of the tray, which was mentioned in a previous paragraph, the tray is now easily removed without distorting the black wax, since the hole destroys any abnormal vacuum that might otherwise be created. The undesirability of an impression that "sticks" too tightly involves a psychological factor which we shall discuss later in this series. Condition of the wax after removal is shown in *Fig. 7*. In some instances the black wax will be found to have come down into that portion of tray designed to be occupied by the ridges, and in other instances to have run down over the border; in both instances this portion of the flattened black wax is cut away, since pressure against the tissues at these two points is exerted in the wrong direction. The tray after being thoroughly dried is ready to receive the plaster.

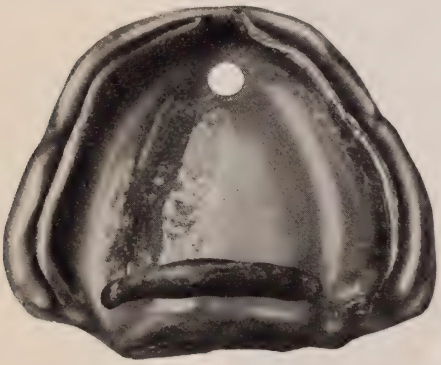

Fig. 6

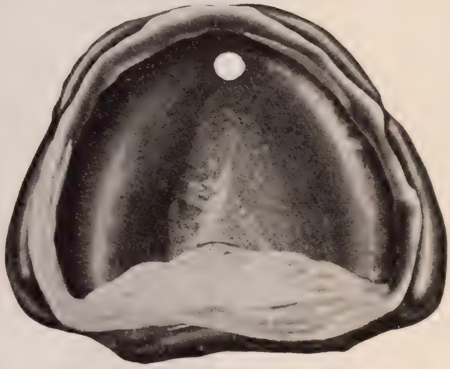

Fig. 7

Fig. 6—Roll of "card" wax in place ready to be inserted for purpose of securing compression of the tissues.
Fig. 6—Appearance of the roll of "card" wax after the tray is removed.

In preparing the patient for taking the plaster impression, he should be instructed to lean forward slightly with the head downward at an angle of about forty-five degrees as indicated in *Fig. 8*. In order to show position of patient during this operation the gown has been removed.

A good grade of fine white cast plaster should be used. The writer has used most of the specially branded plasters selling at the rate of seventeen or eighteen dollars a barrel, and has continued his search for an all-purpose plaster until he has found one that proves to be the best impression plaster that he ever has used and at the same time is equally satisfactory for the making of casts. Such plaster probably is manufactured by different plaster companies in the United States, but the writer obtains it from The American Cement Plaster Co., Lawrence, Kansas (present price, $3.50 per bbl.) He has been using this kind for the past five years and finds no occasion to continue his search for a better one.

After dissolving a small quantity of potassium sulphate in the water, using the finger tips of the left hand in this process, sift a sufficient quantity of the plaster until just too thin, then stir until it begins to thicken, in a manner that is in keeping with the practice of the individual operator. When the operator notices a tendency to set, it should be poured into the individual impression tray, and when it begins to pile up it is ready to put into the mouth.

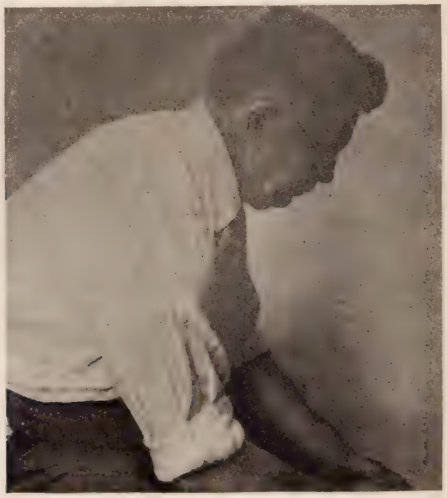

Fig. 8—Position of patient ready for taking the plaster impression. The gown has been removed in order to show position.

Insert the tray of plaster and press to position with a "trembly" motion of the hand; the excess plaster will run and sometimes be forced in a rapid stream out of the hole in the tray, which, while drilled for another purpose, is especially desirable at this moment since it allows the excess to escape without nauseating the patient. Standing immediately behind the patient, the two fingers of each hand are employed on the base of the tray to exert pressure upward and backward in a line with the ears, as indicated in *Fig. 9*. This pressure is continued until the plaster is set. After removing the hands, a period of two or three minutes is allowed for hardening, when the lips and cheeks are then raised and a stream of water is thrown with the syringe over the border of the impression. In the event that the tray is now not easily displaced, the operator may direct the patient to take a mouthful of water and force it up around the impression. Another method, which good psychology will advise against unless other means have failed, is to have the patient with closed lips attempt to blow, thus distending the cheeks in the fashion of a bugler. Wherever possible, the dentist may facilitate the carrying out of his directions by performing the act that he suggests, when the patient easily will imitate him.

While forcing the impression to place, the patient, previously instructed, should emit a guttural sound which is associated with a clearing of the throat. The patient naturally will be inclined to do this, and will be encouraged when he realizes that this attempt to keep the plaster from running down his throat will not interfere with the operator's technic.

The suggestions that have been given above may be amplified somewhat helpfully perhaps, by adding that the pressing of the tray to position, the escape of the plaster, and the emission of this guttural sound by the patient if necessary, all occur simultaneously. Also, it may be observed, that no special haste is required in the taking of the impression. If the plaster is mixed in the presence of the patient, this will eliminate the evident haste which usually characterizes the movements of the dentist in bringing the mixed plaster from the laboratory. The unusual haste will in all probability stimulate an unusual condition of the patient's mind, while the added nervousness thus stimulated militates against the operator's unqualified success.

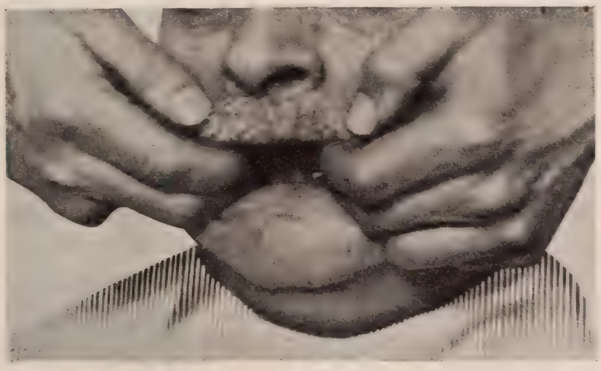

Fig. 9—In taking the plaster impression, the operator uses the two fingers of each hand upon the base of the tray to exert pressure upward and backward in a line with the ears.

In constructing the lower individual tray, practically the same procedure is followed as in the case of the upper. A strengthener made of a piece of No. 12 black iron wire is bent to conform to the inner surface and then flattened so as to take up less space in the Britannia metal tray. Just before the compound is to be placed into the tray, the wire is heated real hot and laid into position so that when the compound is put in it easily imbeds itself.

While constructing this tray and while taking the lower impression patient and operator sit or stand so that their eyes will be on a level, the dentist immediately in front or just to the right of the patient. The metal tray is filled with the compound of the proper consistency and smoothed over the edges so that it will not drop out when inverted, the right corner of the patient's cheek is grasped between the finger and thumb of the operator's left hand, the patient is requested to "open but not too wide," when the left wing (as viewed by patient) of the inverted tray is entered and swinging around to position the other wing will pass the finger and thumb and go to place easily enough. The penciling process is, as in the case of the upper, divided into four sections. During this process the index fingers of both hands are employed to press the tray lightly into position, leaving the thumbs free to massage the cheeks, carrying them upward, thus taking care of the excess material over the buccal and labial surfaces; the inner or lingual borders are raised as far as possible through the patient's action in protruding the tongue. The action of the tongue will often cut the tray off at the desired length, but a dentist with an intimate knowledge of the tissues may trim the inner border off more satisfactorily than will be possible for a dentist who is compelled to depend upon the action of the patient's tongue.

In case of a high ridge and of extractions less than a year, the flange between the posterior portion of the ridge and the tongue may extend farther downward in mouths in which the mylo-hyoid bone is well covered with tissue, than in those mouths where there is pronounced absorption of the ridge. In the last mentioned instances this flange extension would have a tendency to interfere with the lingual ramifications of the muscles of the tongue, thus interfering with the speech. The writer has endeavored for several years to employ this flange in all cases in order to take advantage of the added area it gives, to insure a valve-seal in the region of the soft tissues, and accordingly secure better retention of the denture, especially during lateral movements of the jaw. In some instances the writer has continued his endeavors until his skill and the cooperation of his patient were taxed to the utmost. But patients, who have presented his most spectacular results, and have worn the flanges for some time in order to give them a fair trial and to give the writer full opportunity to demonstrate them before dental societies, have finally cut them off in liberal fashion with manicure file or pocketknife in order to escape the annoyance due to their interference.

The plaster for the lower is mixed with water in which potassium sulphate has been dissolved as in the case of the upper, but slightly thinner, in fact so thin that when the tray is inverted it is necessary to make the inversion during the course of a continuous motion, in an almost arm's length circle, from the point (usually lower than the patient's mouth) where the plaster is poured into the tray up to the patient's mouth. Before the plaster has thickened sufficiently to pour into the tray, a spatula-full is placed upon the ridge on each side and with the forefinger of the right hand the plaster is rubbed into the tissues of the ridge and associated parts. As the inverted tray is settled into position, the forefinger of each hand is used to hold it in place while the middle finger of each hand is inserted into the mouth to push the cheeks out, thus preventing incorporation in the impression of any loose tissue. Still holding the tray in position with the index fingers, the middle fingers are removed and placed upon the outer portion of the cheeks pressing inward; the massaging process is continued, while gradually the index fingers are removed and they and the thumbs assist in completing the operation, (*Fig. 10*), which is aided finally by the patient's action in extending the tongue to touch his lower lip. Obviously, it would not be necessary to use the fingers to hold the tray in position if

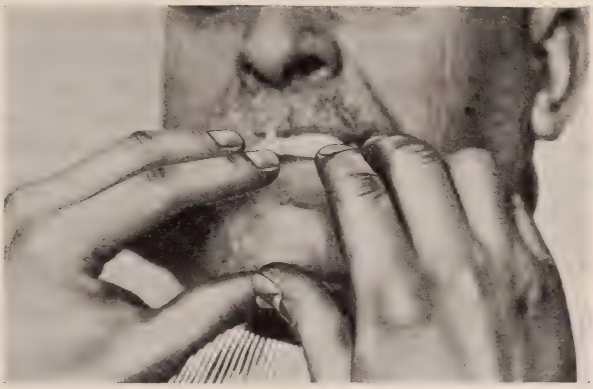

Fig. 10—Final position of fingers in the process of taking the lower plaster impression.

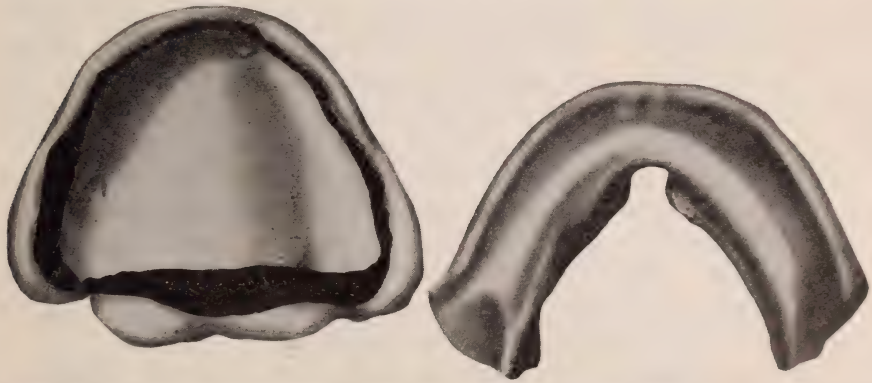

Fig. 11—Completed plaster impressions. In the upper, the black layer of card wax has been accentuated for purposes of illustration.

the operator were not engaged in the massaging process. Usually, with the empty tray the writer is accustomed to carry through the procedure sufficiently to acquaint the patient with the operations that may be expected, and this preliminary facilitates in remarkable degree the actual taking of the impression. After the plaster is hard, the impression is removed and held under the faucet to wash away any superfluous bits of plaster. *Fig. 11* shows the completed impressions.

Finally, a knowledge of the fundamental requirements in the retention of dentures, painstaking care in impression taking with a view to fulfilling these requirements in an individual case, and cooperation of the patient in securing proper adaptation—all combined and applied with persistent effort will give results qualified only by experience.

PRESIDENT'S ADDRESS*

BY E. A. GEILFUSS, D.D.S., MILWAUKEE, WIS.

AS YOUR PRESIDENT it affords me much pleasure to welcome you to the Forty-ninth Annual Meeting of the Wisconsin State Dental Society.

Two years have now elapsed since we last met for the purpose of listening to the presentation of papers and witnessing clinics.

Last year because of war conditions and the close proximity of the meeting of the National Dental Association at Chicago, I deemed it advisable to suggest to the members of this society through our component societies, the deferring of a state meeting of this character. We held a referendum and practically unanimously such action was endorsed by our membership. Consequently, the annual meeting last year was purely perfunctory, only routine business being transacted by the executive council and in the presence of barely a quorum the meeting of members adjourned for a year and the old officers held over.

Much of great importance to our profession has taken place in the past two years. The conduct of the great war and war activities has of course dominated everything else. In October, 1917, Congress enacted legislation which placed dentists in army service on practically the same basis as the medical men, and as a consequence there were in excess of five thousand men commissioned as dental officers.

However, for over a year after our declaration of war, it was impossible for the government to adequately care for the dental needs of service men, particularly those called for enrollment prior to their leaving for the cantonments, and this work was undertaken by the Preparedness League of American Dentists. I was appointed as director for free dental service to the registrants in this state, and it was left to me to arrange details for carrying on the work. Over six hundred dentists volunteered for this in Wisconsin.

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*Address before the Wisconsin State Dental Society, July, 1919.

Inasmuch as I found that the state had been divided into districts to carry on the medical advisory board work, I decided to use these same districts for our work, and accordingly, in most instances appointed as district directors the dental member of the medical advisory board.

I deem it proper to make a record of this work in our State Society proceedings and so shall take this opportunity of listing the names of the district directors and their territory.

Appleton District: Waupaca, Outagamie, Calumet, Manitowoc counties. District Director, G. E. Johnson, Appleton.

Ashland District: Bayfield, Ashland, Iron, Vilas, Sawyer, Price counties. District Director, F. X. Schlecht, Ashland.

Eau Claire District: Polk, Barron, St. Croix, Dunn, Chippewa, Pierce, Pepin, Eau Claire counties. District Director, E. F. Sommermeyer, Eau Claire.

Fond du Lac District: Waushara, Green Lake, Fond du Lac, Dodge, Washington counties. District Director, T. A. Hardgrove, Fond du Lac.

Green Bay District: Forest, Oconto, Brown, Door, Kewaunee counties. District Director, T. R. Houston, Green Bay.

Janesville District: Green and Rock counties. District Director, R. J. Hart, Janesville.

Kenosha District: Kenosha County, District Director, L. E. Kaltenbach, Kenosha.

La Crosse District: Buffalo, Trempeleau, La Crosse, Monroe, Vernon, Crawford, Juneau, Adams counties. District Director, G. F. Hauser, La Crosse, and after his death, E. A. Gatterdam, La Crosse.

Madison District: Richland, Sauk, Dane, Columbia, Marquette counties. District Director, S. H. Chase, Madison.

Marinette District: Florence and Marinette counties. District Director, E. H. Redeman, Marinette.

Marshfield District: Rusk, Taylor, Clark, Jackson, Wood counties. District Director, W. H. Poad, Marshfield.

Milwaukee District: Milwaukee county. Medical Advisory Board dental members: M. N. Federspiel, R. J. Wenker, H. L. Banzhaf, C. W. Hall in general charge of work of district.

Oshkosh District: Winnebago county. District Director, M. L. Christensen, Oshkosh.

Platteville District: Grant, Iowa, LaFayette counties. District Director, Harry Andrews, Platteville.

Racine District: Racine and Walworth counties. District Director, P. T. Van Ornum, Racine.

Sheboygan District: Sheboygan and Ozaukee counties. District Director, H. W. Pohland, Sheboygan.

Superior District: Douglas, Burnett, Washburn counties. District Director, J. M. Donahoe, Superior.

Stevens Point District: Portage County. District Director, M. A. Hadcock, Stevens Point.

Waukesha District; Waukesha county. District Director, G. W. C. Meyer, Oconomowoc.

Wausau District: Oneida, Lincoln, Langlade, Marathon, Shawano counties. District Director, J. H. Kolter, Wausau.

I appointed Adolph Gropper my assistant in the whole work of organizing the state.

I wish personally, and as president of this society, representative of the best in our profession, and as State Director of the Preparedness League, to thank and express my deep sense of appreciation of the splendid work that was done by all of the volunteers.

Especially, do I wish to convey this to Dr. Hardgrove for his magnificent efforts in organizing his district, and to Dr. Hall and Dr. Gropper for their untiring help to me.

A copy of the following letter was sent to each State Director as an indication of the appreciation of our government.

> Dr. J. W. Beach, *President,*
> Preparedness League of American Dentists,
> Buffalo, N. Y.
>
> DEAR DOCTOR: Having been advised of the gratuitous services rendered by members of the Preparedness League of American Dentists in assisting to make dentally fit the Selective Service men after they had been accepted by their Local Boards and previous to their induction into military service, and having learned that about half a million dental operations were performed by members of this organization for those entering military service without expense to the government or the Soldier, I desire to convey to you, the President, and through you to the remaining officers and members by either letter or in person, my sincere appreciation of the patriotic services rendered. Very truly yours,
>
> IRELAND,
> *Surgeon General, U. S. A.*

I think our state and its dentists may well be proud of our share in this great patriotic effort.

Six years ago at the annual meeting of this society, a resolution was passed endorsing action which was about to be taken to organize this state for the purpose of protecting its dentists against unlawful process patents, and an appropriation of five hundred dollars was made to aid towards organization expenses. The Wisconsin Dental Protective Association was incorporated in September, 1913.

At that time, as you will no doubt, remember suits brought by Dr. W. H. Taggert for infringement of his inlay patents had been brought in Washington, which had been decided against him, and in Chicago against Dr. Moll, which was decided in his favor.

No suits were instituted in Wisconsin, but in June, 1914, suits were started against various Chicago and Illinois dentists, as a consequence of which, the Dentist's Mutual Protective Alliance was organized to undertake the defense in these cases.

Ultimately over five hundred defendants were involved. The officers and members of the Wisconsin Dental Protective Association lent their best efforts in support of the defense in these cases. In fact, I believe we can say without conceit, that our support did much to give standing to the Alliance.

The cases were strenously litigated until in March, 1918, Judge Geiger decided the case in the District Court of the Northern District of Illinois against Dr. Taggart. The case no doubt will be further tried in the Circuit Court of Appeals, as an appeal already has been taken, but we strongly hope that Judge Geiger's decision will be sustained.

This protracted litigation has necessitated the expenditure of large sums in attorney fees and expenses, and a referendum is now being had to permit of the levying of an assessment on the members of the Dentists' Mutual Protective Alliance, to pay the already contracted bills and carry on the litigation.

I sincerely trust that it will be freely carried, and that this great task of relieving our profession from an unjust oppression finally will be finished in an honorable and creditable manner.

I feel that I would be remiss in my duty as your President did I fail to compliment and congratulate you as members for what this society so nobly did six years ago in giving support to this undertaking.

So far as I know, this society was the only state organization which sustained this work to the extent that we did.

Within the past two years further advance has been made in the standardization of our dental colleges and in the raising of the requirements for graduation. As an indication of the appreciation with which efforts in this direction are held by our institutions of learning, it is well to mention the conferring of the honorary degree of doctor of laws on Dr. H. E. Frisell, the dean of the dental college of the University of Pittsburg, by Marquette University a few weeks ago.

I am informed that at the present time there are but three dentists living to whom this high honor has come.

At the same time that I thus call your attention to the great honor conferred upon a man for his noble efforts in advancing education in his profession, I wish to mention a matter which has come to my notice since acting as your president, and regarding which I had had no previous knowledge.

I find that it has grown quite customary for some of our professional brethren who have achieved great prominence and reputation, when invited by a society such as this to read papers or deliver clinics, to expect remuneration.

This, I consider, an extremely reprehensible practice. It has long been customary to pay the expenses of men coming to us from outside the state, which courtesy seemed fair and proper, but when some of our most prominent men expect to be paid money for accepting the honor of reading a paper before a body such as this, I feel that it is placing the dollar mark where it should not properly belong and commercializing our profession too much.

Much good has been done by the research institute of the National Dental Association. I feel that it would be well to suggest that a department be created similar to one in the American Medical Association, to scientifically determine the value of the dental proprietary articles in general use and frequently prescribed and endorsed by us, such as mouth washes, tooth powders and pastes.

Since this society has become a component of the National Dental Association, and it is only through membership here that membership in the National can be enjoyed, the value of our membership has increased greatly and it becomes more and more necessary and important that the rights of all our members be carefully safeguarded.

This duty rests largely in the hands of our secretary whose work must be painstakingly done. To my mind the duties of secretary are the most important of any of our officers.

It takes time to become familiar with the duties of the position, and it is only after the work has been well systematized that it can be promptly and reliably carried on. I would suggest that the custom be established of continuing in office from year to year, as long as he will accept the office, the secretary who fulfills his duties acceptably.

A proper salary should be attached to the position. I realize that our limited income probably will make it impossible to make it adequate, but our best efforts should be directed to that end.

Further, I would suggest in this connection that the business office of the secretary be established in Milwaukee, as being the point most accessible from all parts of the state.

In 1915, Dr. Wm. Hopkinson, in his president's address, called attention to the fact that in 1908, at the time of the reorganization, this society had less than two hundred members. He reported a membership then, of six hundred and forty-nine and expressed the hope that it might be increased to one thousand by 1920.

Our membership today is six hundred and nineteen, but this is a paid up-to-date membership, as the very definite rules of the National Association prescribe that a member be promptly dropped for non-payment of dues. In 1917, it was five hundred and seventeen. In 1918, four hundred and ninty-three.

I agree with the idea expressed by President Krause, in 1916, that our membership could be largely increased by personal solicitation. Our enlarged membership will, however, necessitate our giving very careful consideration to the matter of meeting places for our annual meeting, so that those in attendance may be properly cared for.

I know of no city in the state where this can be done outside of Milwaukee, and much as I should personally regret to see this occur, I am afraid that it will become necessary to recognize that only in this city can the needs of our members be adequately met, and consequently our meetings held here quite regularly.

As a matter of fact no invitation came to this society from any other city during the past two years.

An effort was made during this session of the legislature to lower the standards for the practice of dentistry by the introduction of a bill in the assembly, making it mandatory upon the State Board to license any honorably-discharged dentist who had been in the military or naval service in the great war.

Through the very commendable efforts of your legislative committee and particularly Dr. C. W. Hall, this effort was frustrated and the bill not passed.

The clinic which has been arranged for this meeting is an innovation. Those taking part in it are all members of this society, and your clinic committee feels confident that you will find the subjects as well presented as at any you ever have attended.

In conclusion, I wish again to thank you most sincerely for the honor conferred on me and to thank the officers and committee members for their loyal support.

Goldsmith Bldg.

DISCUSSION

DR. HARDGROVE, Fond du Lac: It is indeed a pleasure for me to open the discussion on Dr. Geilfuss' paper today, and I want to congratulate you as a society for having in office in a time so important, a gentleman with a temperament inclined to executive activity and organization.

There may be some of you who know that Wisconsin in the work of the Preparedness League, accomplished probably more in proportion to its population than any other state. This probably was the best organized effort of any state in the union. Now, that sounds like rather large talk, but the facts bear it out, and I think to a large extent it is due to the organization and executive ability of your president. There are many of us who took his instructions and carried on the work to a very successful conclusion, but the stimulus was derived to a large extent from your president.

The doctor in his address has called your attention to a number of things that are important. One thing in particular is the question of legislation with reference to patents. As I view that subject, it is largely a question of ethics. We are arrived at a point where the dentist is really not doing as much as he should. Your distinction and your accomplishment will be measured to a large extent by your ethics, and the question of dental legislation will be governed in the future, if you can raise the standard of ethics among the dental profession to a point where they feel that they have accomplished anything; when they can get to that point, you have a high degree of ethics. So that, if I were a member of an examining board, I would insist upon the examination being passed on the question. I think it should be required; it gives you an idea of the type of man who is going to practice the profession. The question of membership also will be effected by ethics. This society soon will grow large enough so that it will be so attractive for the young graduates to belong to it, so instructive, that they will not hesitate to join it. A personal canvass will not be necessary when we reach that point. We are enacting a re-organization at the present time so far as ethics are concerned.

Now, the doctor, while he has not specified any particular paragraph on the question of ethics, yet reading between the lines, the whole fabric of his talk is one of a higher standard of ethics.

Now, the standing of the dentists in the army and out of the army is a question as yet not settled. It is hard for us to know whether we have gained or lost by our work in the army. There are those who believe we have gained, and those who believe we have not. It will take time to determine that. The chances are that we have gained some. During this meeting Dr. Logan will be here, if he is not here today, and he will explain his views on that subject.

As to the question of meeting place, I haven't any doubt but that Milwaukee is the best point to meet, and that it would be a good plan to meet here primarily and often, but to pledge ourselves to meet here permanently would be a very serious mistake, because there are many districts in this state which you can not disregard. For instance, you cannot disregard the Fox River Valley. You cannot entirely disregard that territory. They always have given you a good meeting and once in a while it would be a good idea to meet in the Fox River Valley.

The question of remuneration for clinicians at meetings, brings back the original question of ethics. If a man has achieved success along a certain line, it does not belong to him; it belongs to his profession and incidentally to the public, so that a man who is charging for that kind of service will soon find himself in ill-repute. I do not know but that it is a mistake for some men to go around the country giving courses sometimes based on scientific fact, and sometimes not—most times not. These subjects should be taught in institutions equipped for them. We are not going to arrive at a proper scientific standard in the estimation of the profession, by going at it in an individual and haphazard way. After all, the subject of dentistry is entirely dependent upon pathological conditions and we cannot teach these in an off-hand manner. For instance, the subject of pyorrhea, which is being taught in many places the wrong way; we should go back to the foundation, the study of physiology and biology. It is largely a pathological condition. Then that brings into consideration, the question of research. Now, we have points of research that were established. We have none in Wisconsin. One should be established at the University of Wisconsin, where research work could be carried on for the benefit of the society.

Then we come to the examining board and the question of ethics arises again. Until we can appoint, or have appointed men who are ethical and scientific on the examining boards, we cannot expect to raise or elevate it to a high point. These men who make these examinations should be selected with care. It should be out of politics, and it should be the business of this society to take it out of politics and devise some way that the examining board can be derived from men who are leaders in their profession and who are authorities on the different subjects.

It is a pleasing thing to know that Marquette University has found out that there are men in dentistry who have achieved things of importance. In my estimation there isn't any profession that has achieved more for humanity that the dental profession. It is impossible to measure the amount of discomfort and pain that the dentist has prevented. The medical profession of course, is the mother of the profession, but where has the dental profession ever headed off many diseases that it is necessary for the medical profession to deal with later? We are pleased to know of the honor which has been conferred upon Dr. Frisell for his educational efforts. But look about us and we see men who are working in the same field of dental education. Take for instance, Dr. Banzhaf, who has worked as hard for dental education as Dr. Frisell, whose executive ability along that line you may know and may not; some of us know what he has accomplished, some of us do not. Take Dr. Gregory, of Chicago. So that I say, we do not need to go far to find men who are entitled to recognition. If there are only three men in the United States today upon whom that degree has been conferred, then there is a mistake some place. The profession has not been able to show the world that these men are doing things of great accomplishment and of great achievement, so if Marquette has taken an early stand on the appreciation of dental effort, it is gratifying. Now we hope that men who are working along, will some day reach the degree that marks their distinction. I thank you.

Dr. C. W. Hall: It affords me extreme pleasure to have the opportunity of discussing your president's address. To follow Dr. Hardgrove who has gone into the discussion so deeply, so clearly and so fairly, I am afraid will be something of an effort on my part to give you very much more than you already have had.

Dr. Geilfuss in his paper speaks of your endorsement of the Dental Protective Association six years ago. Of course, this is history. Some of you know merely the outside facts; what was accomplished and what was attempted at that time, but it gives me considerable pleasure to speak to you of what your president achieved at that time. I want you to know that in the estimation of those who sat in council with your president six years ago, and five years ago, and four years ago, in meetings in Milwaukee, in meetings in various towns over this state, in Chicago and over the state of Illinois, Missouri and other places, that I can say, and I feel that I can truthfully say, there is no man in the state of Wisconsin who held higher ground and accomplished more for the dental profession in that matter than has your present president. (Applause). At all times it was the principle at stake. At no time personal feeling. The dental profession faced a menace, and Dr. Geilfuss along with some others arose to the occasion. Thus far, we are still on top and hope to remain there.

Standardization of your dental colleges, which your president has spoken about, and Dr. Hardgrove has covered very carefully; there has been a great deal of work done along that line in the past few years. Dental schools it seems to me, always will arise to the level that the real profession wishes them to. We have been guided a great deal in the past by the medical profession, and in years past we have asked the medical profession to teach us those things in dentistry which they know, but it seems to me that should be a thing of the past. The new idea will be to teach dentistry by dentists. It is the thought of the progressive school today and it has to come, and dentistry must rise in its course of study, in requirements and in the number of years of study to the level of any other profession before it reaches its real zenith. In other words, there is no one who can give dentistry anything; dentistry has got to take it itself, and it is going to do it through the dental college research institute of our National Association which is doing a wonderful work. If there is a possibility of an institute of this kind in the state of Wisconsin, it certainly will be welcome. We believe there is a place for it.

Selection of a secretary in a central location of the state; a selection of any officer of your association is a matter I might add, of the choice of your society. As to convenience, it seems to those of us who are in the most congested parts of the state, that the preference is for Milwaukee as the home of the secretary of the society. And dare I add a personal thought, that I firmly believe that the annual fee of this association should be raised to such a point that an adequate stipend could be paid for a secretary, either a dentist or an efficient secretary outside of dentistry, to carry on this work, as I believe it will be to your benefit. It is an immense task to take care of the work of this association. It takes more time than a busy dentist has to give, and no money that we have thus far found fit to give him adequately pays him.

The increase in the membership is primarily up to the members of the many units that go to make up this association. You should work hard in your local districts. There is only one way of increasing the membership in my estimation, and that is by making it clear to each man in the component districts that he is the loser. Go out to him and he will come back to you.

The laws and legislation of which our president has spoken is a problem. If you have to work with politicians, it is bad enough to work among dental politicians, but when you get up to state politicians, it is worse. We find on our statute books when comparing our dental laws with those of other states, that we are almost at the top, if not at the top. I doubt if there is another state in the union that has better dental laws than the state of Wisconsin. There is one little slip which gives the governor of the state the privilege of selecting, or appointing rather, the state board of dental examiners, and as Dr. Hardgrove has stated before me, the State Dental Society should have some opportunity of at least suggesting the members of that board.

At the time our state dental law was framed, I am told by those who had much to do with it, that it was an impossibility to pass a law with that provision, and since that time those of us who have had something to do with the legislative portion of our state dental society, have felt that we have had a very good law and it might be well not to tamper with it. We always have felt that we have been very fortunate in the men—in the selection the governor has made of our dental board. We can find fault at all times, at any time, with anyone, but it is rarely that we can honestly find fault with the State Board of Dental Examiners of recent years.

The clinics: Dr. Geilfuss has promised you some good clinics. They have been arranged as probably a great many of you know, almost entirely within the district of Milwaukee's component societies. It seems to me that if this year's clinic is a success, that it will be a great example of what can be done in the future for our State Dental Society in the way of arranging clinics. We have in the state, a great many component societies all willing to work. What wonderful work would be done if each component society would take upon itself some particular branch of study to exhibit in a progressive way at our annual meeting.

This idea comes to me through a little experience I had while working upon the killing of the bill which the president has spoken of in his address, at Madison last winter. I had occasion to call upon the different component societies for help at that time, and the response that I had at that time was something so marked that I thoroughly realized the power of this organization to accomplish anything in dentistry that it sets out to do. I believe with the exception of two or three component societies, every one furnished signed copies of resolutions against the legislation which was detrimental to our ideas. Some of them sent representatives to Madison, half way across the state and almost the full length of the state. Some other organizations prepared resolutions and through delays in the mails their efforts did not reach us in time. Nevertheless, they were on the job at that. I realized then like never before, that the component idea in study work or in any effort which we have a mind to accomplish, is the one thing that is of more value to this organization than any other. It should be developed and the membership should be increased, and other organizations of the kind should be developed in the state where there are none at the present time.

I wish again to thank Dr. Geilfuss for his excellent paper that he has given this society. Underlying that paper is the ideal that always has been carried down through this organization for its forty-eight or forty-nine years of its existence, and as I sat here today and listened to it, I wondered what the founders of our State Dental Society would say were they here at each meeting of the society and watched the progress. We have some of them that have been here through a great many years, and those men know better than the younger men of the organization the value of organized dentistry and united effort. I thank you.

Dr. O. G. Krause: There are few things I can suggest. I want to emphasize what he said about selecting a secretary located in this city. Having had a little experience with this society, and knowing the amount of work that is necessary to conduct this organization, I think the secretary ought to be located in this city—the office in this city, and a member of this society, and an adequate salary attached to the office.

The question of a meeting place is a very important one. We have wandered around this state for the past eight or ten years, going throughout the state trying to hold conventions, but gentlemen, this society has outlived the small town idea. I do not mean that the small towns are not as good as this, but they haven't the hotel facilities to adequately accommodate the members of this organization. With the beautiful hall we have in this city and the adequate hotel facilities, I do not see why we should meet in any other part of the state.

The Fiftieth Anniversary I would suggest is fast approaching. I believe it is next year. That is one thing we ought to emphasize, and we want to work very hard so that we will make the Fiftieth Anniversary a success.

President Geilfuss: I wish to thank the men who have so kindly discussed my address. Some of the things that they have said regarding my personal efforts in dentistry almost overwhelm me. I am frank to say that my ideals regarding this, my profession, always have been high, and I will say, as I have said many times during the past twenty-nine years I have been out of college, that I owe many of them, if not all of them, to my teachers—to the men who inculcated them into me at the University of Pennsylvania. For that reason I feel that it is up to every member of this organization, to every man who practices his profession, to bear in mind the duty that he has undertaken in espousing the healing art as his life work. I feel that it is up to him, as Dr. Hardgrove has said, to feel ethics, but I did not realize I had given expression to this thought in writing this paper regarding the true ethics of practicing this or any other profession.

I feel that we can thank Dr. Hall for his thought in reference to what the college, the *alma mater*, has done for the student it turns out and their constant effort to increase their standards, and it was with that thought that I touched upon this matter of a custom which apparently has in the last few years sprung up regarding which, as I very truthfully said, I had had no concept until it was brought home to me as president of your society; that many men of the most exalted reputation in our profession today, had grown accustomed to being remunerated for the time which they saw fit to expend in addressing or presenting to bodies of this kind, what they had gotten from their profession. I was making this criticism as your president, and I questioned whether perhaps it might not be considered in good taste for me to have done so, still, now, in closing this discussion, I feel that I should have the right to express my personal views, and personally I feel that there are no words strong enough in derogation of this custom. I feel perhaps that that should be qualified. I feel that a man who goes out an gives up his own time for a series of days, to practically give post-graduate work to a body of men, who see fit to bring him to their doors, has a right to expect remuneration, but I strongly feel that it is carrying the thing too far when it has gotten to the point, as I know it has, where men expect to be compensated in dollars and cents for reading a paper. In that way we would have no progress in this or any other profession. The men who are called upon to give of their time for their own benefit, for the benefit of their profession, for the benefit of their fellows, might expect first that they would be handed a retainer, as any lawyer would be for espousing a cause. We are what we are, largely through the efforts of those that have preceded us, but if we are to carry on our life share of our work, it is up to us to carry the work to those who come after us. (Applause).

Dr. Hardgrove spoke to me this noon about a matter regarding which I have very little information, but in the few words that passed between us, I gave expression to the thought that has been with me as long as I have been in practice. Dr. Hardgrove if I understood him correctly, spoke of a matter of interchange of licenses between states. I think I told him then I believed the time would come when there would be some national board of medical examiners, dental examiners and other examiners before whom men after they had taken their degree could present themselves for examination, after which they would be entitled to practice their professions throughout this our country. I always have felt that and I feel it more strongly today, and I have strong hopes that something of that nature may before very long be consummated. I feel that the rapid means of transportation have practically eliminated state lines and something of that nature will of necessity have to arise.

There are other phases of our professional work which I believe should be thought of at least by us. I did not feel that I was sufficiently conversant with the subject to make any definite suggestions, but there are phases which have to do with the economic life of many of the world workers, the employes in our large industries. We find large employers of labor are becoming cognizant of their duties to their employes. They are establishing almost hospitals in their factories and work shops, and I presume it has come to many of you, as it has come to me, that these men have conferred regarding the best methods whereby they could advance the interests of their employes from a dental standpoint, and unfortunately in my case, I had to concede my inability to give them good fundamental advice. I feel that it is up to us to think of, and possibly develop some way whereby the most good can be done in that direction. It is being done in other communities, whether by the suggestion of support of the projector or not I am not prepared to say, but it is at any rate a subject of tremendous importance from an economic standpoint. We recognize that many of the operations which are now being generally undertaken are long, tedious to the patient and primarily very expensive. We recognize that if it is proper they should be undertaken, it is proper they should be undertaken for those patients who are unable to pay the proper fee and the problem then presents itself, how are we going to solve it? Will it be through the medium of clinics or some method of co-operative procedure which will make that type of work possible for those who are not able to pay.

I wish to thank you once again for the honor that has been conferred upon me and thank you for your very kind attention. (Applause).

FOCAL INFECTION*

BY F. GREGORY CONNELL, M.D., OSHKOSH, WISCONSIN

I WISH TO EXPRESS MY APPRECIATION of the honor that has been extended to me in representing the medical profession at this meeting. I believe there will be more reciprocity between the medical and dental professions, and I hope that it may happen that in our time we may have a conjunction of the medical and dental professions, which must mean that a dental graduate must have received a medical degree before he becomes a dental practitioner. The two professions are so closely related, that it seems to be the necessary step before things will be perfect.

The theory of focal infection is not new. Virchow, in 1870, discussed the question and demonstrated its occurrence. Benj. Rush, over one hundred years ago reported the cure of hip-joint disease by removal of a tooth; but the contributions of Billings, Rosnow, Hartzell and others that carried this subject to the peak of popularity, were brought out about five years ago.

Of course, we all know the inadvisability of passing judgment upon an idea, a theory or method when presented by its originator or sponsor; judgment must await the accumulation of independent observations, and it would seem that we now have reached a time, that we might expect to gather data leading to a justifiable conclusion regarding a subject that has been for these years under very close study and observation.

It is, of course, certain; that the subject was overestimated at the onset, and equally certain is it that there is a very great deal of truth in the underlying principles of focal infection.

Focal infection has been looked upon as have many other subjects during the last decade, from an over-specialized view point.

Lack of specialism retarded advancement in medical science for many generations; over-specialism has now started in to exercise this same detrimental action upon medical progress.

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*Read before the Wisconsin State Dental Society, July, 1919.

Ultra-specialism may be and probably is most beneficial to all, except the specialist, in the manufacture of an automobile; but ultra-specialism in medicine results in a narrow mindedness, a biased view of facts, clinical history and findings, that many times lead to incorrect conclusions.

Ultra-specialism in a factory or in commercial pursuits, with an authoritative supervising head to regulate and coordinate such specialism, may be advantageous, and perhaps must be imitated in well-regulated metropolitan teaching hospitals; but this is radically different from the ordinary specialism as is seen today in the medical and allied professions.

Specialism of a technician under suitable guidance and direction of one who, instead of being a specialist, is a generalist, certainly will be more desirable than the present state of affairs.

Independent specialism is worse than none, and coordinated cooperative specialism is the only manner in which as complex a piece of machinery as the human body may be studied, handled or repaired.

For example: The heart specialist must not only know about the heart, but also about the thyroid gland, the pneumogastric nerve, the stomach, the so-called rheumatism and the various focal infections that call for a knowledge of all parts of anatomy, physiology and pathology.

Therefore, he must be a generalist in order to be a specialist; of course, he could become an expert at percussing and outlining the heart and a specialist in that particular; but without his other knowledge, this ability to measure the heart will be of little real benefit. Either he must know these other things, or he must work with one who does in order that his speciality be of real worth.

Another example: in your work, to expect a man to know about the teeth and not about the antrum of Highmore is as ridiculous as to have one specialist for upper teeth and another for the lower teeth.

If you know about the antrum of Highmore, then you must of necessity know about the nasal cavity and the other accessory sinuses. The teeth, the tongue and the tonsils are so intimately associated that they must be considered together.

With enlargement of the glands of the neck, the teeth, the tonsils and sinuses must be suspected. We must send the patient to different specialists in order to clear up the possibilities of the case. Each specialist alone is of comparatively little value, but coordinated each becomes invaluable.

The surgeon who removes a tonsil only and is not conversant with the nose, throat, sinus, ears and teeth is as much of a moving manikiu as a piece operator in an automobile factory. We must avoid over-specialism.

A focus of infection is a localized septic condition, a suppurative process, with or without local manifestations; that is, a primary source of secondary systemic intoxications or microbic metastasis (direct extension to contiguous structures, and extension along normal pathways, such as stomach and ear from mouth, are not included).

Whether the secondary manifestation is an intoxication due to a filterable virus or to bacterial metastasis is, of course, a *most important* and elemental point which must ultimately be conclusively settled, before therapy for the secondary lesions may be entirely rational. But the first step in therapy, in either event, will be the elimination of the primary source of infection if it is still active.

An *infection* is a morbid state due to the invasion and propagation within the body of pathogenic micro-organisms. *Toxemia* denotes a morbid condition produced by the absorption of bacterial toxins. A distinction, with our present knowledge in this particular subject, of more academic than practical value; but as our information increases, it will assume more and more importance.

It is not necessary for the production of systemic or remote effects for bacteria to be disseminated from a localized infection; their toxins may be absorbed and the resultant toxemia may exercise a deleterious influence either upon the general system or upon special tissues or organs. In this way the blood, the nervous system, the heart, kidneys, other tissues and organs may be affected. The injuries inflicted upon the nervous system and the heart in diphtheria are striking examples of this toxemia.

It has been suggested that toxins are responsible for lowering the powers of resistance of certain tissues and thus preparing the ground for the invasion of these structures by bacteria in the various forms of focal infections.

A most common source of such remote infections is in the mouth and the most frequent cause is streptococcus viridans.

Rosenow and Billings have shown conclusively that such infection may be responsible for many remote affections, the relationship of which has hitherto been unsuspected; that secondary effects may be very great and out of proportion to the cause which may seem to be very trivial; and that these organisms may develop an elective or selective affinity for certain tissues or organs, the streptococcus viridans for joints, tendons, aponeuroses, muscles and the endo-peri- or myocardium, and that these streptococci may change in their characteristics after growth on culture media or in animal tissues.

The conditions supposed to regulate this "transmutation of strains," is the degree of exposure to oxygen; it is claimed that a streptococcus may become a typical encapsulated pneumococcus or *vice versa.* This elective affinity and transmutation of strains of bacteria has not been universally accepted, and if rejected does not greatly interfere with the theory of focal infection.

All of this has brought forcibly to our attention, the subject of chronic diseases, and the fact that very many of them are often due to distant, remote, often symptomless, localized areas of infection, which often are situated in the head, but may be in one or more of many possible locations.

The point that is many times overlooked is that there may be one or more foci of original infection which may produce one or more secondary manifestations, and that thorough, competent search for the original focus is not carefully carried out.

The following parallel columns should be most prominent in the mind of one considering the possibility of focal infection.

A

Possible Source

- Head
  - Teeth
  - Tonsil
  - Nose
  - Accessory sinuses
  - Ear
- Gastro-intestinal
  - Stomach
  - Gall bladder
  - Intestine
  - Appendix
- Genito-Urinary
  - Kidney
  - Bladder
  - Prostate
  - Urethra
  - Seminal Vesicles
  - Uterus
  - Tubes
  - Ovaries.

B

Possible Secondary

- Blood—Anemia Pernicious.
- Lymph—Lymphadenitis.
- Eye—Iritis, Keratitis, Choroiditis.
- Neck—Thyroid Hyperplasia.
- Heart—Endocarditis, Myocarditis, Pericarditis.
- Lung—Pleurisy, Pneumonia, Peritonitis.
- Liver and gall bladder (diseases of).
- Stomach—Gastric, Duodenal ulcer, Appendicitis.
- Kidney (diseases of).
- Bone—Osteomyelitis, Periostitis.
- Joint—Bursitis, Synovitis, Arthritis.
- Muscles—Myositis.
- Nerve—Neuritis, Herpes Zoster, Chorea, Myelitis, Meningitis, Epilepsy. Insanity.
- General—Asthma Hay Fever, Urticaria.
- Hodgkins, Leukemia.

Now, the facts with which to start a consideration of this subject are found in the above parallel columns and other facts that must be emphasized are:

First, the conditions in column B are not *of necessity* due to infection from a focus enumerated in column A.

Second, A may exist without B resulting.

Third, patients much reduced from long illness may suffer from an alveolar or other local infection as a secondary process; in other words, under certain and usually very confusing conditions, A may be the result of B.

Fourth, granting the causal relationship between A and B, the removal of A will not cause the cure of B, if B has undergone permanent organic changes; if multiple foci exist and only one is corrected; if secondary foci have developed and are not corrected.

This gives one an idea of the complexity of the subject; but if these elemental facts are kept in mind there will be much better results and less disappointment in the treatment of conditions suspected to be due to focal infection.

Time will not permit of a consideration of each of these possible secondary results of localized infection, but a few may be considered in brief.

For example: *Pernicious Anemia* frequently is referred to as being secondary to oral infection, but since recent intensive study and experience with this disease, it would seem no longer justifiable to so class it. The removal of teeth, tonsils, appendices, gall bladders, and spleens has still left pernicious anemia a most fatal disease, the improvement following any or all such removals of possible foci of infection being in all probability due to the occurrence of remissions which characterizes the disease.

Glands of the Neck—Lymphatic glands enlarged are examples of direct extension through the lymphatics to the lymph nodes.

Thyroid hyperplasia must be looked upon as a possible result of mouth infection as long as a definite etiological factor is unknown.

The relationship between localized infection in tonsils and dental regions and diseases of the various structures of the heart has been unquestionably demonstrated, but Blum says:

"The presence of pathogenic bacteria in the mouth and fauces, with subsequent development of endocarditis, is by no means conclusive evidence that the endocarditis originated from these foci, and the complete absence of reports of identification in endocardial lesions of the specific bacilli present in the suspected foci, constitutes a deplorable breach in the chain of reasoning. That under proper auspices endocarditis can originate from these sources may without question be assumed; but the frequency in childhood of alveolar disease and tonsilitis when contrasted with the rarity of endocarditis, justifies the conclusion that such a sequence is certainly exceedingly rare. (Holt says that in autopsies of more than one thousand children less than three years of age, not a single case of endocarditis was found. Among 1,345,398 school children examined in New York in 1909-1913, less than one per cent. showed cardiac disease). The assumption that streptococci harbored in the tonsils possess special selective powers against the endocardium and the joints seems unjustified."

While the more rational sequence, from an anatomical point of view, of head infection followed by pulmonary or pleural disease, is considered to be less common.

Similarly, the development of disease in the abdomen or the stomach, intestines, appendix, liver, etc., are many times not traceable to foci of infection, when such foci are present in the head, while diseases of the kidney are many times secondary to teeth, tonsil and sinus disease.

Osteomyelitis is unquestionably a focal infection and likewise the usual periostitis (specific).

By far the most attention has been given to the question of focal infection in abnormal conditions of the muscle, joints and nerves, so-called "rheumatism." In this connection it is advisable to consider a recent communication from the Mayo Clinic in the *J. A. M. A.* (4-26-19) entitled "Tonsillectomy in Myositis or Arthritis," by Lillie and Lyons.

This is a report of two hundred such cases in which tonsillectomy was performed and their conclusions are as follows:

First, it is justifiable to advise a tonsillectomy in every frank case of myositis or arthritis.

Second, a marked improvement may be assured from tonsillectomy alone in seventy-nine per cent. of all cases.

Third, it is necessary to remove all possibility of dental sepsis; by so doing a larger percentage of patients will be improved.

Fourth, the duration of the myositis or arthritis is a factor in the ultimate results, although benefit and even complete cure is obtained in some long standing, chronic cases.

Fifth, forty per cent. of the patients with chronic myositis who are invalids will respond favorably to tonsillectomy.

Sixth, the size of a tonsil has no bearing on its possibility as a focus of infection. A careful expression of the tonsillar crypts and a history of throat trouble associated with the myositis or arthritis is essential in the diagnosis.

Seventh, an absence of history of diseased tonsil in no way eliminates the organ as a focus of infection.

Eighth, a clean tonsillectomy with the removal of the plica tonsillaris is necessary in every case.

In this report one misses a definition of myositis and of arthritis; also does one miss a series of control cases in which the tonsils had not been removed. Such a comparison would seem to be indicated, because functional disorders have been included in the report as is shown by the statement, "In many instances of long standing, painful and enlarged joints, the joints have immediately decreased in size and become useful. We have a number of patients who went to the hospital for operation using crutches or a cane, who were able to discard them thirty-six hours later."

As a contrast, one may refer to the most comprehensive report and analysis of cases by Crowe, Watkins and Rothholz (Johns Hopkins Hospital Bulletin, January, 1917) of Johns Hopkins Hospital, entitled "Relation of Tonsillar and Nasopharyngeal Infections to General Systemic Disorders," in which they divide the arthritis group as follows:

1, Infectious Arthritis; 2, Myalgia, 3, So-called "Rheumatoid Arthritis"; 4, Acute Rheumatic Fever.

Each of these is defined and they then report "Infectious Arthritis," of thirty-one cases, twenty-four were improved. In four cases of "Myalgia," all were improved, though the authors say, "it might, of course, have cleared up, for all we know, if no operation had been performed." Of nine cases of so-called "Rheumatoid Arthritis," only two improved. Four out of twenty-five cases of "Acute Rheumatic Fever" have had a recurrence after leaving the hospital. It is quite evident that the tonsils are not the only portal of entry for the organisms that cause rheumatic fever.

And the following from Blum:

"Billings reported that Rosenow injected cultures of streptococci obtained from the tonsils into the circulation of animals; arthritis ensued and the deduction was made that the injected streptococci possessed a characteristic which caused arthritis. The fact seems to be that when bacteria are injected into the circulation, arthritis occurs as an incident of the inducted septicemia. Arthritis commonly occurs with septicemia. Pyogenic bacteria in general, manifest a predilection for the serous and synovial membranes. When, as a result of circulatory invasion by bacteria, morbid processes ensue, it is usually the serous and synovial membranes that are affected. Meningitis, pleuritis, endocarditis, synovitis occurring in the course of such infections are manifestations of this principle.

Rheumatism is a name used to designate a symptom-complex, the chief characteristics of which are polyarthritis, accompanied by fever and pain, with a tendency to implication of the serous membranes, especially the endocardium. As the science of bacteriology has developed and knowledge in this field has increased gradually, there have been eliminated from the earlier group of cases clinically classed as rheumatism, special forms which now are designated arthritis of definite types of bacterial infection—for example: Gonorrheal arthritis, typhoid arthritis, etc. As knowledge further increases with the passing of time, it is to be expected that the group will be still further depleted as other forms of arthritis are recognized, and ultimately, rheumatism, as a diagnosis, will be discarded or accepted as indicating those forms of arthritis of which the etiological micro-organism is unknown. At different times since the theory of the bacterial etiology of rheumatism has been accepted, various micro-organisms have been alleged to be the cause of rheumatism. At present, the streptococcus is blamed, but there are numerous types and strains of streptococci and evidence of their exclusive guilt is lacking. That the power of attacking serous and synovial membranes is not limited to the streptococcus is obvious on contemplation of such phenomena caused by various other micro-organisms, for example: So-called typhoid and gonorrheal rheumatism, tuberculosis, meningitis, arthritis and endocarditis, staphylococcus, pleuritis, peritonitis, etc. It seems that the selective morbidity is due, not to a single specific micro-organism, but to lower power of resistance to bacterial aggression possessed by serous and synovial membranes. This explains why in infectious processes lesions of the muscles, bones, nervous and connective tissues, though they do occur, are less frequent than lesions of the serous membranes and joints. In childhood secondary foci in the more resistant tissues are commoner than in adults, owing to the comparatively weaker power of resistance of these tissues in childhood. The occurrence of tuberculous hip-joint disease so frequently after a fall or injury, may be explained by this theory. Similarly may be explained the selection of the knee-joint and ankle in the teamster as most vulnerable to gonorrheal attack, while in the blacksmith, the shoulder or elbow is affected by preference. The tonsil appears to have exceptional powers of resistance to focal infectious processes; secondary focal infections of the tonsils are exceedingly rare, though Seawell has called attention to their becoming infected secondarily to pulmonary tuberculosis. Tubercle bacilli having gained access to the circulation from a focus in the lung or elsewhere and lying in wait for a favorable opportunity, secure a foothold in the hip-joint, which as a result of traumatism, offers a *locus minoris resistentiae.* (The terminal artery theory also may be accurate).

And from Hammond, who says:

"In many cases, there is a tendency to overestimate the role of these infections in causing more serious diseases. It is difficult to establish the etiology, as, for example, in a case of chronic arthritis of several years standing. Dental examination shows several non-vital teeth. The roentgenogram may reveal any degree of change from a slight rarefaction of bone to a blind abcess. The teeth have been filled for years and have given no trouble. The joint infection is hematogenous and a certain percentage of dental infections are hematogenous. Why may not both of these infections have resulted from a mild general bacteriemia and have developed coincidentally? Also, if the joint condition came first, why may it not have caused the dental condition? Other infections are quite as likely the cause as those in the mouth. Arthritis cases by no means clear up after mouth infection has been removed.

The relation of the teeth and tonsils to arthritis is at present a moot question: Billings and his followers point to the careful work of Rosenow and others on the bacteriology of arthritis and to the numerous cases of improvement and cure of arthritis following the removal of diseased teeth and tonsils. They believe that this proves the accuracy of their contention that a focus of infection exists in the head in many cases. On the other hand, many trained pathologists and reputable clinicians have been unable to reproduce either the laboratory findings or the clinical results of the Chicago workers. Consequently, they either reject the theory as a whole or accept it in a greatly modified form. It is probable that the pendulum has swung too far in the direction of the wholesale removal of teeth and tonsils. The truth probably will be found in a middle ground somewhere between their divergent theories."

The nervous symptoms attributed to focal infection are very numerous and many times are difficult to explain.

"Neuritis" (?) which usually is used as a synonym for "pain," is often attributed to a focal infection, is many times a transitory affection and frequently subsides after the removal of a focus of infection, as it frequently does without such removal. On the other hand, "Neuralgia," as best exemplified in tic douloureux, is not influenced by the removal of any known focus of infection.

Owing to the frequent association of chorea with endocarditis, and arthritis, and the occasional amelioration of symptoms after tonsillectomy or the extraction of teeth, chorea has received considerable attention in recent discussions of focal infection, but, as yet, the etiological factor or factors in chorea have not been recognized.

So it will be seen that there is a tendency on the part of some to question the adaptability of this theory of focal infection, to some of the conditions to which it has been enthusiastically applied as a causative factor. That it is an active etiological factor, in certain conditions may not, of course, be doubted.

The type of dental or other infections that chiefly concerns us is the obscure, latent or camouflaged, as it were, type. The danger of a frank, open, and above board howling toothache or other abscess, both as a local and focal infection, is apparent to even the lay or untutored mind. *Infections are never entirely localized. As a rule* this type of infection does not act as a focus of general infections, because it either gets well or becomes a chronic infection before notable secondary effects are manifest.

The chronic abscess with sinus and "pyorrhea" of the gingiva of the peridental membrane or of the alveolar bone with demonstrable pus are comprehensible to the average mind. But it is the symptomless tooth, with a dental granulomata or blind abscess, devitalized teeth, dentistried teeth, with imperfect root-canal fillings, that are many times the original focus for secondary infections.

These conditions have been likened to chronic osteomyelitis of the structural bone, and in this connection I may say that I have yet to see a resultant or apparently resultant distant "neuritis" or "neuralgia" associated with chronic osteomyelitis of the structural bones.

The diagnosis of this class of pathologic conditions of the mouth requires special study and an educated technic.

Like everything else in medicine, proper therapeusis presupposes a correct diagnosis, which in these peridental infections is not as easy as might be supposed. The removal of the tonsil became a fad; the indiscriminate removal of suspected teeth in some quarters borders on this condition.

One of the most interesting and confusing features of the question of focal infection is the apparent discrepancy between the trivial cause (tooth or tonsil apparently well and causing no local disturbance) and the very marked effect.

And again, that many vague symptoms, indefinite, shifting, not localized, often considered to be "neurotic" or functional, may be due to a small focus of infection. The only way in which this can be explained is by considering these symptoms to be due to anaphylaxis, allergy or protein intoxications.

Such symptoms as nervousness, malaise, dizziness, drowsiness, inability to concentrate, inexplainable weakness, prostration after slight mental of physical exertion, slight fever or subnormal temperature, slight tachycardia or bradycardia, vaso motor instability may follow the parenteral injection of foreign protein.

This may or may not be the correct interpretation of such symptoms; they may be due to abnormal functions of the endocrine glands, but it at least offers a working base from which the problem should be studied to a definite conclusion.

Teeth, the source of infection, and bridgework and crowns that retain infectious material must be cleaned up or removed. Consultation and team work between the dentist and physician, each benefiting from the other's special knowledge is most desirable.

The recognition of dental infection may be easy, if apparent, and should be corrected on general principles with or without secondary symptoms of focal infection.

Foci of infection, notably head and mouth infection, should as a general proposition, be removed or corrected in case of coincident disease such as lues, tuberculosis, gastro-intestinal and genito-urinary diseases. Such a correction will many times greatly augment the treatment directed against the more serious disease.

When symptoms present, that indicate a focus of infection somewhere, the teeth among other possible causes must be suspected, and it is then that the X-ray is invaluable, especially in the blind abscess or dental granulomata following devitalization of teeth.

Such abscesses should be corrected, but it does not necessarily follow that they are the cause or the sole cause of the secondary symptoms.

"The interpretation of dental roentgenograms is full of pitfalls. Unless one is familiar with dental anatomy and pathology and the varying appearance of shadows produced by roentgenograms taken from different angles, serious errors will be made. It is possible to take a roentgenogram from such an angle that an apical abscess is apparently demonstrated. A plate or film made from slightly different angle will disclose only normal bone surrounding the tooth apex. The reason for this error lies in the fact that at certain angles the shadows of the nasal cavity or antrum may overlie the tooth root and simulate the appearance of an abscess.

The point is, that an apical shadow merely signifies decalsification of bone, from any cause. It may represent a slow change, such as atrophy or absorption from long continued irritation or pressure; it may mean an acute infective process or it may signify the remains of a former disease-scar tissue. These shadows do not necessarily indicate the presence or absence of pus. This fact can be determined only by a study and correlation of the symptoms and clinical findings."

Thoma well says:

"The development of the Roentgen diagnosis has greatly facilitated examination of the oral tissues, but such a diagnosis should not be entirely relied upon. The application of temperature and electrical tests, as well as the diagnostic use of local anesthetic, are quite frequently necessary in order to ascertain the exact location and nature of the trouble.

"The X-ray is a most valuable adjunct in the diagnosis of peridental infections, but it is not sufficient in itself, and like many other means of diagnosis, calls for a proper interpretation. I find great difficulty in reading dental roentgenograms, and I find that there is many times a marked diversity of opinion among those who take the pictures and are more conversant with such interpretation.

"I suppose it is not much different from the X-ray work in abdominal surgery; the less one knows about the X-ray, the abdomen and surgery, the more satisfactory is the demonstration, by means of the X-ray, Barium meal examination."

"Treatment of focal infections must be both local and general. But the fundamental principle is a thorough removal of the primary focus.

As to the local treatment, that is your specialty and it is not for me to presume to tell you what to do. It is quite evident that different varieties of the conditions call for different methods of procedure. What will be satisfactory for an early gingival pyorrhea, will, of course, not be efficacious in the alveolar type, nor the root abscess.

Some jaw abscesses may be cured by treatment through the tooth's root. Still others by surgical interference, and others by extraction.

As to the treatment of a root abscess by other means than extraction, of course, it is a question of complete enucleation, radical wide excision. If this can be done without reinfection of the adjacent parts and with retention of the tooth good and well, but it might be advisable to consider the lesson to be taught by our tonsil experience; anything other than complete removal of the tonsil resulted unsatisfactorily.

Plastic operation upon the alveolar margin aiming at drainage at the bottom of the cavities is theoretically correct, but good results have escaped my detection.

Curettage may cause more damage and render tissue more liable to infection. It is probably similar to curettage of the uterus in gynæcology, which is now but rarely performed.

What to do with devitalized teeth, in cases presenting symptoms of focal infection, is a dental problem which in all probability will call for extraction in the absence of other incriminating foci until the question of this danger is positively settled, which will come in due time with increasing experience.

W. A. Price, in an "Abstract of Discussion on Chronic Mouth Infections, in Their Relation to General Diseases," (*J. A. M. A.*, Sept. 16, 1916) says:

"Devitalized teeth must be extracted. Researches in the Research Institute of the National Dental Association have not been able to sterilize one single canal; medicine used included sulphuric acid and formalin and others not to be used in ordinary conditions which were used as part of the experiment. The area beyond the tooth apex cannot be sterilized by any means, but dentists can so change the balance of safety for the patient that nature may have a chance to destroy the reduced infection."

In all probability the question will in the future be less vital, due to teaching of oral hygiene and prophylaxis and a recognition of the potential dangers of the devitalized tooth, with a decrease in its performance and improved technic, making it less dangerous where it is carried out.

Billings in speaking of arthritis cases says:

"*First*, removal of cause; *second*, improvement of the immunity by rest, personal hygiene, including good food, pure air, and sunshine, rational calisthenics and physical culture, moral support and cheerful environment. Autogenous vaccination may be added to still further improve immunity."

"Moral support and cheerful environment" are without question most important and helpful adjuncts in many lines of treatment; but still I know of no diseased condition in which it is recommended but what the results of the treatment are far from satisfactory.

In conclusion, I take pleasure in quoting again from Blum:

"The theory of focal infections is by no means new. It has merely been revived and elaborated. Unfortunately attention recently has been concentrated upon certain potential foci of infection to the practical exclusion of others at least equally important. The results are that the subject is being treated in a narrow manner instead of receiving the broad consideration it merits, and that diagnosis and treatment are empirically directed within restricted limits instead of considering the potentialities of the entire body. It follows that in cases in which disease is due to an infective focus, avoidable mistakes locating the focus frequently are made, and results of treatment are correspondingly disappointing. Another element in the failure to achieve predicted results is the inclination, a failing of many physicians, that is, to attribute too many ailments to the reigning idea, in this case to focal infections. It should be kept constantly in mind that not all illness is caused by infective foci."

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DISCUSSION

DR. WM. HOPKINSON: I wish to congratulate this society on hearing this paper today. I enjoyed the remarks of the essayist in introduction, inviting the dental profession to come home and cooperate with the medical profession in the healing art, but when you do come home and become physicians, then this problem will be fully dealt with. I also wish to state to the essayist that if the medical profession would only come home and with their medical course, take a dental course, then dentistry and medicine could come nearer together, without being one profession. (Applause).

It is rather hard for me to discuss this paper today. It covers a great deal of ground and I have read but a few pages of it.

One thing I wish to say is that the essayist has settled for all time today, that there is something in focal infection; that there is a great deal in focal infection and whether it has been overestimated or not is a question to my mind. The point that it has been overestimated is in a lack of diagnosis of the proper points of focal infection, not only by the dentists. The dentists have been very conservative naturally, because up to the present time we knew very little about focal infection, as far as the mouth was concerned, although twenty-five to thirty years ago, the prominent dentists at that time talked focal infection, mouth infection, to the physicians, and it was considered unnecessary to listen to these points. But, within the last four or five years, bacteriologists have taken the question up.

Rosenow and Billings—these men practically demonstrated in the hospitals that many cases of arthritis were cured by the extraction of certain teeth. As I stated, the point is whether that has been overestimated or not. I believe it has not been overestimated and believe that we, as dentists and physicians, have not made accurate diagnoses. The point of the general practitioner as dentist and physician is one that should be duly considered. We, today, are quite closely in contact with the physicians. They are calling on us for dental diagnoses. I can quite understand why the essayist is confused in reading the dental roentgenograms, because it does take a knowledge of the pathology surrounding the mouth and the teeth and the contiguous parts, in order to read a dental X-ray. I do not believe that dental X-rays are misleading. We are apt to read them without knowledge of X-rays, and that is the point where dental X-rays are misleading. I believe, in my own experience, that the pathological conditions surrounding the teeth are a good deal more serious than the X-ray shows. In fifty per cent. of the cases in which you see a slight area of rarefaction, it does not show very much in the X-ray. You begin to treat a devitalized tooth. It does not take very long in some of these cases to show you that there is latent infection there, and in a few days the patient will demonstrate to you pretty clearly that there is something wrong, while the X-ray did not show very much wrong. The point is, that we as dentists have to know the difference between bone and the periosteum, between a rarefied area and an infection; we have to know when there is a pathological condition. Of course, it has been stated that the only way to know whether there is a pathological condition is to operate, and find out whether there is or not. Now, that has done a great deal in surgery. While I believe that in most cases they are justified, I do not believe that such a thing would be justified in the mouth. I believe that we must guide ourselves by the condition of the patient. We must know the age of the patient; and at this point I want to bring up the question of relative results of focal infection in childhood and at other ages. Now foci of infection of the mouth, generally known as alveolar abscesses, pyorrhea and other like diseases are rarely found in the mouths of children except in deciduous teeth and probably up to the age of ten, up to the first molars, practically absent in children, so it is not worthy of consideration. As has been stated, children do have arthritis, and they do have heart lesions, but I do not believe they are due to focal infection in the mouth.

The question of whether primary foci of infection and a secondary foci of infection is important or not, if we have any foci of infection in the body, I believe it should be removed; it makes no difference whether it is primary or secondary infection, it should be removed. If we have a primary infection beginning in the mouth and carried to the knee joint or to the heart, the question of removing the primary infection, as the essayist says, does not always cure the secondary infection. Perhaps it is because the secondary infection becomes a primary infection after we have removed the primary infection, but if we had removed the primary infection before the heart lesion was formed, then we would have removed that infection entirely. So it does not make much difference whether it is primary or secondary infection; it should be removed.

So the main point that we men as dentists want to carry from this essay today is, that we must do our duty and remove every foci of infection in the mouth, either by treatment or, but not always, by extraction, and we must learn to read X-rays. We must take X-rays for the benefit of our patients. Of course, make them pay for it; they should; but we must make diagnosis not merely by looking in the mouth and guessing at it, but by going at it in a scientific manner and doing what we can to remove these foci of infection. It has been our trouble not to know enough about these things. The doctor is right. We ought to take more medicine; we ought to take more bacteriology; all of these things; they belong to us, not because the medical men take these things. It is not very many years ago that Dr. Black was called Crazy Black for teaching bacteriology in Chicago. One thing we ought to remember; that such meetings as these are educational; we want to be conscientiously doing the things for our patients that are right, and in order to do so we must do them scientifically, and we must use good horse sense. I thank you.

DR. H. G. MORTON: I think you will all agree with me that this is one of the most interesting papers that we ever have had before this society. I cannot tell you how I have enjoyed hearing it a second time, and I am sure that if you all heard it a second time or could take it home and read it over carefully again, you would feel even more enthused than I feel at the present time. The dental profession is in somewhat of an embarrassing position. We have been taught for years the ways and means of treating diseased teeth and diseased tissue in the mouth. We thought for many years that our methods were adequate, until five years ago we were told that we were very, very far off the track. The sterilization of roots, the filling of root canals—we were told by the writers and men who have influenced us most, that we were decidedly wrong; there must be a change. Here we are today, trying to find out where we stand on this very, very important question of infection. I venture to say that most of us are feeling, "I am sick and tired of it. I wish we did not have to listen to another paper on this subject." Yet we can get hope from the fact that if Benjamin Rush found one hundred years ago that there was a connection between the teeth and the hip joint, we must know more about hip joint, and the physician must know more about teeth, and before we pass from this earth, dentists will have a medical education. It is imperative.

Many of us feel satisfied with our efforts toward the public and the profession. I feel sorry for many of them. We must exhaust the subject and cooperate with the findings of men like Rosenow, Billings, Hartzell and Price. These men have influenced us most. I believe as Dr. Connell has stated, that these men have somewhat overestimated the subject. I believe in their enthusiasm they have led us to believe that every tooth with a rarefied area at its apex is detrimental to the health of the patient. When extracted, many of the patients have been greatly benefited, many were not. Many of these teeth even in the hands of Billings himself, he has left in the mouth and these patients have improved, and some of them have not improved. In other words, his ability to determine what teeth, or which teeth are to be removed if he is going to create a curative effect in the body has been a rather doubtful problem from many angles. I believe the time is here now when we must be conservative; we must be guided by common sense. Many a thing in dentistry, and many things in medicine have been worked out in bursts of enthusiasm.

For me to discuss this paper from a bacteriological standpoint I think is foolish. The only thing I can say is, the lesson I get from this paper, which will be of benefit to the dental profession is, that we have to start from this moment and renew our efforts to prevent the occurrence of infection. And every man who stops for one moment to take cognizance of every opportunity and thought to study and improve, to develop and better his work, is certainly derelict in his duty to his profession. I many times think that members of the medical profession lose one viewpoint. There is not a man here but knows that up to five years ago we knew practically nothing about the treatment of a root canal. We infected these teeth. We used unsterile instruments. I believe in my own mind that a large portion of the infection actually was placed in the tooth from the outside, rather than an incubation process which came from a change in the environment of the tissues. The public today are in a position where we can tell them so and so must be done. We must have their cooperation just as much as a surgeon must have the cooperation of the patient if he is going to perform a successful surgical operation.

I often have thought over this statement, that it is just as wrong for us to treat the root of a tooth for a patient who has perhaps limited means, and say to ourselves or the patient that has only a few dollars, we will only take out a few dollars worth of the pulp of his tooth, as it would be were a physician to say of a patient, will we only take out about thirteen dollars worth of his appendix. We have to find a way of standardization of the treatment of teeth, and whether the patient be rich or poor, there must be a means of taking care of that patient in a correct way. How it is going to be done I do not know, but that is what we must work toward and for.

Now then I want to thank Dr. Connell for coming down here. I believe the impression he has left with us will be felt for some time to come. I hope there is not a man in this room but that will go home from here feeling that he has the biggest job that has ever been undertaken by any man on earth; just as big as the president's. I thank you.

Dr. P. B. Wright: We have listened to a very scholarly paper this afternoon and one of vital importance. Being the last one to discuss the paper, there are some advantages and some disadvantages. The advantages are that all the important things have been said, leaving very little to say; the disadvantages are that one cannot bring out the ideas that he would like to bring out. If I repeat the things that have been said this afternoon, it is simply because we might say, "Great minds run along the same channel."

As long as there is a division of opinion among the medical and dental authorities in regard to focal infection which affect the system, we, as dentists, must use our own best judgment and deal with these cases according to the clinical findings. I believe Dr. Hopkinson is right when he says that the X-ray does not tell an untruth. It is simply our inability to correctly diagnose the conditions which are found in the X-ray. I know in my own case, I can see more things in the radiograph than I saw a year ago. As we gain experience in observation and study of X-rays, we will find more points which will have a bearing upon our management of the case. The dental profession has a great opportunity to take its part in observing the welfare of the patients who come under their charge. Prevention should be the watchword. If a radiograph shows suspicious areas, whether the tooth should be extracted or whether it should be saved, should be governed by several factors.

The first factor to consider is the patient's health. That should be the prime consideration.

The second factor should be the value of the tooth to the patient. If the tooth is one which can easily be replaced by suitable bridgework, fixed or movable, the sacrifice of that tooth will not mean so much to the patient.

Third, the probability of success in the attempt to sterilize and fill the root canals of that tooth to make it safe for the future.

Fourth, the cooperation of the patient during, and after treatment.

We should bear in mind the natural resistance of the tissues when they are given a chance. When we have evidence that the infection has been removed, or when we have treated that tooth with the end in view of removing the infection, time alone will show whether the tissue is healthy tissue or not. When the patient improves in health at the same time, we can only come to one conclusion, that we have at least removed the infection from that one source.

The presence of devitalized teeth should be revealed to the patients, and they should be made acquainted with the fact that they have devitalized teeth in their mouths and that they should report at stated intervals for an examination, both radiographic and cultural, so as to make sure that no trouble is going on which is not being checked. No one has a right to assume that a devitalized tooth is safe simply because it never has given any trouble. I believe no dentist should treat or should restore a devitalized tooth, without first taking a radiograph to find out the condition of that tooth. To do otherwise is dangerous to the health of the patient and is dangerous to the reputation of the dentist. I believe the time is coming when every dentist will have in his office or have access to, an X-ray machine, and make frequent use of it, not only to safeguard the patient, but for his own satisfaction.

Dr. Morton hit on a very important feature, and that is the improvement in the technic in our treatment and filling of our root canals. I believe there lies the security of our success or the safety with which we may leave devitalized teeth in the mouth. I believe that if a dentist will exercise surgical care in the treatment of these cases, that he will have ninety-nine per cent. of success. I would hate very much to feel that the last few years I have practiced dentistry were all for naught. I have done a great deal of root-canal work. I have saved a great many teeth and I may be wrong, though when I see patients improving in health, and conditions in general improving, I am encouraged to keep on, although I probably am extracting more teeth today than I did a year ago, but I believe we are saving too many hopeless teeth. I think until we know for sure what the effect of devitalized teeth is going to be, we should leave just as few devitalized teeth in the mouth as possible.

As we improve our technic and as we improve our methods and make them more along surgical aseptic lines, our success will improve in that ratio.

It seems to me that the matter resolves itself into a question of good judgment on the part of the dentist and of placing the welfare of our patients above all other considerations. I thank you.

DR. WEAVER: I wish to speak for cooperation between the general practitioner of medicine and the dentist. Every day we are confronted with conditions in our pyorrheal and prophylactic work which show that the mouth is probably nearly a directory of the general physical condition of the patient. For instance, conditions which we would expect to easily eradicate in the way of inflammations and so forth, some times do not respond to our treatment, and of course, the answer is, in that particular case, the general systemic condition of that patient must be carefully looked into. As another example, take for instance, two children in a family; one of which may be puny and rather anemic; the other may be a strong, robust child. The mouth of the strong, robust child may show considerable caries and perhaps inflammations of the gum margins and so forth. The other, the weakling, shows a beautiful set of teeth and gums. Why these conditions should be apparent, we are absolutely unable to state, and it is up to the medical profession to tell us why or tell us what should be done in the way of diets and so forth to correct these conditions.

In serious pyorrheal troubles, it is absolutely imperative that the dental surgeon and the family physician work together. Advanced cases need urinalysis, blood counts and usually a thorough physical examination, for the dental surgeon cannot correct entirely with his surgical work, conditions which have been in the system for perhaps years, although often, these said conditions may have arisen from pyorrhea and kindred troubles, so I say that if we expect to get the best results from our work, the cooperation of the general practitioner of medicine and the dentist is one of great importance.

DR. RASMUSSEN (LaCrosse): The subject of focal infection, ladies and gentlemen, is one that has occurred to me for such an extent for a great many years, that I cannot sit still when the subject is being discussed. I believe it is one of the most important, if not the most important subject of all branches of the healing art today. Dr. Charles Mayo has said that all of us who die a natural death, die from infection. That statement I suppose goes unchallenged? I think he also said that ninety-five per cent. of that infection—I think I am correct in that—ninety-five per cent., has its origin above the gall. Dr. Charles Mayo has not made that statement without investigation.

It has been said here today that up to five years ago we knew nothing about it. I challenge that statement. I have forgotten who made it, so there is nothing personal in it. You will find the speaker on record ten or twelve years ago as reporting clinical cases, urging the importance of always cleaning up any infection. It is true, we did not know what we know today bacteriologically, but it always has been nothing more than good common sense, that any infection anywhere affected the entire system. Why was the general surgeon most particular if an infection occurred about a finger nail or a toe nail. Why then did we neglect infections, blind abscesses or otherwise in the mouth; abscesses that were discharging pus by the gallon, give them time enough. They were all neglected. Why? They did not hurt. But the infection about the nail or anywhere dit not hurt probably. I stood, myself, in the dressing room of a large hospital and saw a very prominent surgeon dress an infection about the toe nail, and he impressed upon that patient very strongly that he must not neglect it; that he must be certain to come back the day after tomorrow and have it dressed, "because you understand that while this infection is now confined to the toe apparently, you are absorbing the toxin," and he went on to explain that very thoroughly. I quite agreed with him. That same man, he was one of the men whose names stand high today, and will so stand as long as the annals of surgery shall last, that same man utterly ignored infections about the mouth. Why, I do not know, but he did. Since, he has come to see his mistake. I said a moment ago that I was on record. You will find me on record as having made a statement to this effect, after appealing for asepsis in root surgery and thoroughness in removing all dead, diseased tissue and the sealing of the root canal at the apex, after making that plea, I asked this question: "What good is all this careful technic, if after you have opened your canal, removed all dead tissue and have your canal in good aseptic condition, then take a guttapercha root point in your apex cavity, that stands open; that was possibly spilled on top of the counter in the supply house, close it up, what good has your technic been?" I asked that question over ten years ago in a dental society meeting. I am glad that the subject of focal infection has at least gotten a hearing. I thank you.

TECHNIC FOR CAST GOLD INLAYS*

BY WISCONSIN INLAY UNIT, DR. H. G. MORTON, MILWAUKEE, CHAIRMAN

CAVITY PREPARATION

IT IS WELL to have in mind cavity preparation in classified form, such as simple, compound and complex. A simple cavity is one involving one surface of a tooth, i. e., lingual, labial, buccal, or occlusal. A compound cavity is one involving two surfaces of a tooth, i. e. mesio, occlusal, distal-occlusal, etc. A complex cavity is one involving three or more surfaces of a tooth, i. e., MOD, etc.

The general method of preparation involves the extension of the cavity outside the area susceptible to decay. The margins should be prepared as near a right angle to the body of the tooth as is possible with just sufficient divergence to allow the removal of the wax pattern without distortion.

A general preparation of cavities for an inlay does not differ much from the preparation for any other material, i. e.—removal of decay and all overhanging margins. The floor and pulpal wall should be flat and at right angles. The buccal and lingual axial walls should be beveled to an angle of twenty to thirty degrees to the pulpal walls—the gingival walls to approximately ten to twenty degrees. The walls, margins, and angles should be finished down as smooth as possible so that the wax pattern has no surface obstruction.

The instruments best suited to obtain these results are a set of right and left straight and obtuse angle chisels, fissure burs for straight and contra-angle handpiece, No. 557 and No. 559, gem stones No. 05, 32, 34, 31½ and 40, mounted on mandrils suited for both handpieces, and safe-sided sandpaper disks, coarse and fine.

Complex cavities for the reception of "three-quarter crowns" involve the same fundamental principles as simple and compound cavities; namely, the removal of all short enamel rods and paralleling of walls as near as possible. However, another consideration to be borne in mind is the additional stress which is to be carried by the attachment owing to its function as a bridge abutment.

In a general way the preparation of a central, lateral, and cuspid consists in paralleling the approximal walls from gingival to incisal, remove about one-half the thickness of the enamel from the lingual to make room for the thickness of your metal. This can be done by the use of three-eighths or half-inch stump stones.

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*Demonstration before the Wisconsin State Dental Society, July, 1919.

Next, cut a groove with a very small, sharp-edged, mounted stone between the labial and lingual enamel plates across the incisal or slightly lingually to the incisal edge. Now begin your longitudinal grooves on the medial and distal in line with the long axis of the tooth, near to the labial enamel plate so as to grip as much of the body of the tooth as possible. To make sure that your mesial groove is parallel with the distal, and to see if the grooves of one tooth are parallel with those of another, take a snap impression in beeswax, and you readily can see by looking into the impression if there is any deviation. These grooves can be made by the use of stones and fissure burs of suitable sizes.

The preparation of bicuspids and molars does not differ very much except that the dressing down of the lingual cusps is necessary, and the use of the right-angle or contra-angle hand-piece is resorted to for drilling mesial and distal grooves.

PATTERN MAKING

Taggart's wax and Kerr's wax have a more velvety appearance and toughness combined with elasticity in preparing the pattern than any other waxes on the market.

To soften Taggart's wax it is best to use moist heat or the electric appliance. The temperature of the water should be between one hundred and twenty and one hundred and thirty degrees, and the wax should be allowed to remain in the water from eight to ten minutes.

Kerr's wax is best softened with dry heat.

Prepare the wax in cone shape for introduction into simple cavities. In compound cavities it is best to form the wax in the shape of the letter U before inserting into the cavity. After inserting the wax into the cavity, and patient allowed to close the jaw, hold it there until the wax is about the same temperature as the mouth. In simple cavities it is not always necessary to remove the wax to see if it is all down into place. If the gingival margin in compound cavities or other cavities is not sharply defined, reinforcing may be necessary. A wax composed of two-thirds beeswax and one-third paraffin with lamp black as coloring may be placed along the margin and the pattern replaced so that a perfect impression may be made. It is necessary to hold the wax to the margins so that they will not spread from it. This may be done by holding a tapered spatula on either side keeping the wax to the walls. Care must be exercised after the teeth have been brought into occlusion so as not to distort the pattern. In carving the pattern always carve towards the margins, burnishing them more than cutting. Great care should be exercised in the carving of occlusal surfaces, especially occlusal planes, as we believe an artificial surface should slightly exaggerate the natural tooth. A study should be made of tooth anatomy and the operator become efficient in handling wax by carving models of the entire tooth in wax. After the surfaces have been definitely carved, the pattern should be wiped with oil of cajuput, and explorers then used to remove the pattern.

It it is impossible to invest the pattern at once, it may be carefully placed in a glass of water, which is at room temperature and invested later.

INVESTMENTS

Assuming your matrix is correct, the next question is investing.

There are several excellent investing materials on the market, but the Inlay Unit has decided to show only two, "Taggart's" and "Weinstein's."

Whatever investment is used it must be studied carefully, its physical qualities noted, and a definite check made on the time required to mix and invest with the aid of an interval timer or clock.

We have found that Taggart's instructions as to mixing, with the exceptions of some variations, can be followed successfully, and will quote from his findings. A necessary precaution, however, is to test each box carefully so that there is no question in its use from day to day.

"A casting of uniformly good inlays is a scientific process; the best results are obtained by accurately proportioning the powder to the water. For this purpose a weighing device is given.

Fill the large cup with loose powder and scrape off level with a straight plaster spatula. Place the weighing device on the fulcrum and with a water syringe fill the small cup until it exactly balances. Then place the fingers over the powder and pour the water into a clean plaster bowl and add the powder. Spatulate for three minutes, then jar and rotate the bowl for two minutes more. On account of the fluid condition of this mixture this prolonged manipulation permits all the air and gas bubbles to come to the surface.

The inlay should first be painted with the investment material and the balance, which just fills the ring, poured in in such manner as to permit it to trickle down the inside of the ring. Do not hurry the work as there is a period of at least eight minutes during which the material is workable and in twenty minutes the wax can be burned out.

Follow the directions carefully as they are of vital importance. Nodules on inlays mean faulty manipulation.

Five pounds pressure is sufficient to use in casting inlays. If for any reason you wish the investment thinner and to set more slowly, place a button of metal in the small depression next to the powder; this will take more water to balance it, or use very cold water and a cold plaster bowl."

In using Weinstein's investment we have balanced powder and water so that three minutes are allowed before setting, one minute for spatulation, one minute for rotating, and one minute for painting. The weighing device can be a simple cylinder with a compartment in the center and each end cut down to hold just the required amount of material.

Instruments for mixing are a clean large rubber bowl and rubber spatula, each kept for that special purpose, interval timer or clock, and a sable hair brush.

The pattern having been previously washed in a solution of acetone or alcohol to remove any mucus or deposits, it is ready for investment. It is also recommended that that pattern be invested as soon as possible after being made, and if that is impossible, keep same in a water bath, the water being at room temperature.

First, the investment and water are placed in the bowl and spatulated by keeping spatula in contact with bowl, and with a wrist motion spatulate and rotate the bowl at the same time for one minute.

Second, inverting bowl on its side tap gently and rotate for one minute more.

Third, place bowl on its side and carefully paint the surface of the inlay by drawing the brush in one direction. When thus covered, the balance of the investment can be poured into the ring from the bowl. It has been found best to let the investment thus prepared stand for one hour before removing sprue and placing on fire for heating.

HEATING FLASK

It is the most important operation for the success of our casting. The heat should be applied slowly so that there is no agitation of the wax or the investment, in fact the moisture is being driven off without the removal of all the wax. By proper timing the residue of wax remaining after the moisture is driven off is most important because the residue acts as a flux for the gold. The flask should be cooled so that the investment returns to its normal shape.

The gold should be carefully cleaned by the use of a flux and nothing but clean gold of known quality ever used.

It has been found that the most practical casting device contains centrifugal motion; *first*, because the flask can be cooled, and *second*, because the machine is simple and can be obtained by all.

The inlay upon removal from the investment should appear bright and clean.

The inlay should be placed in the cavity, polished with disks and stones, care being exercised to polish toward the margins, and if the contact is not perfect, additional gold should be added, after which the inlay is polished on a lathe, and then cemented.

CASTING

Each step from cavity preparation to pattern making and investing may be perfect and yet a failure result from carelessness in not understanding and following certain principles in heating the flask preparatory to casting.

Assuming that out invested pattern is correct to this point, it should stand approximately one-half hour before the sprue is removed by heating over a Bunsen flame. If the sprue and sprue stand have been coated with vaseline, both can be removed cleanly without any breakage or sticking.

The heating element can be a simple Bunsen burner, gas or electric stove, the main point to be made in either case being the proper amount of heat and length of exposure. We believe that the heat should never exceed 300 degrees Fahrenheit and only sufficiently long to expel the moisture. In fact a residue of unburned wax remains which acts as a flux for the incoming gold and keeps it clean and bright when removed. When moisture has been expelled the flask is cooled to about room temperature. It a Taggart casting machine is not available, we recommend centrifugal motion as giving the best results in our hands. Gold for casting should be clean and of known formula and when additions are made to a used nugget, the same proportion added.

We recommend the nitrous oxid blow-pipe because the flame is smaller, hotter, and gives less trouble by oxidation. Several nuggets should be in use so that one can be cleaned and left in acid ready for subsequent use.

We have endeavored to outline a simple plan of operation in making gold inlays which has yielded splendid results in our hands. It can be followed by any one if sufficient study will be made of each step so that its repetition will become exact.

We offer this brief synopsis simply to help memorize what has been shown in the four sections of our unit.

Go home at night, and instead of sitting in a card game, do some hard reading.

Give your employer about twice as much service as he has any right to expect. Don't boast about how hard you work. Just dig in, and hope for the best.

Follow this plan for one year, and if at the end of that period you don't win a prize—well, the game is crooked in your present establishment, and you will be wise if you quit and start in somewhere else. But I think you'll win.

TECHNIC FOR CONSTRUCTING FULL UPPER AND LOWER DENTURES*

BY WISCONSIN DENTURE UNIT, DR. G. P. BRENNER, MILWAUKEE, CHAIRMAN

THE MODELING COMPOUND TECHNIC FOR TAKING IMPRESSIONS

SELECT A SUPPLEE TRAY of the proper size and adapt perfectly to the vault at the heel, being careful that it extends to the vibrating line which is usually indicated by the *foveola palatina*, The tray must be free from the buccal and labial side of the ridge to allow space for compound, and be short enough to clear all muscle attachments. The tray in the region of the tuberosities must be cut away freely so as not to interfere with the free movement of the coronoid process. Having properly prepared the tray a suitable amount of softened modeling compound about the size of a walnut is heated over the Bunsen flame until it sizzles and firmly attached to the tray. This is now moulded into the approximate shape of the jaw, having it too high at the periphery and formed in the form of a pyramid in the vault, keeping the heel of the tray free of compound.

The compound is now glazed in a Bunsen flame and equalized in water at one hundred and sixty degrees, when it is ready to be inserted into the mouth, under slight pressure, bearing upward and backward, being careful that the tray is perfectly seated to the vibrating line, and in proper lateral position. The tray must be held absolutely quiet so as not to distort the compound until it is hard, which requires from two to three minutes, after which time the impression is removed and thoroughly chilled in ice water. All surplus is now trimmed with a knife, leaving a rim one-sixteenth to one-eighth-inch thick. This snap impression is now inserted into the mouth and tested for stability in the vault, which is the only requisite.

A bite block is now attached to the bottom of the tray by rolling compound in the form of a roll, varying from one-quarter to one-half-inch in thickness, and about three inches long, according to the case in hand. This compound is now heated over the Bunsen flame and securely attached to the back of the tray. It is now shaped to the form of the ridge and placed into water at a temperature of one hundred and sixty degrees to soften it uniformly, being very careful not to heat the compound of the impression in the vault. The tray with compound roll attached is now placed into the mouth and the occlusal plane is established by placing an occlusal plane-former into the mouth and adjusting it parallel to a line drawn from the *alæ* of the nose to the external auditory meatus, and laterally, parallel with the pupils of the eyes. This occlusal plane-former should be pressed upward parallel to the lines just described until the upper lip touches it slightly when in a position of rest. The occlusal plane-former and impression are now removed and thoroughly chilled in ice water, when the compound bite block, can now be trimmed to proper contour. The groove of prehension one-sixteenth-inch deep is now cut in the bite block in the region of the first molar and the median line to guide the lower bite block to position. Also cut the upper bite block short at the heel to the center of the second molar.

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*Demonstration before the Wisconsin State Dental Society, July, 1919.

A Supplee lower tray is now carefully fitted to the lower ridge so it clears all muscle attachments and compound blocks one-quarter-inch thick are added with a tracing stick at both heels in the region of the first molar and chilled. The surface is now slightly warmed in the Bunsen flame and the tray placed in position on the lower jaw under slight pressure, while the anterior part of the tray is held clear of the lower ridge about one-eighth of an inch in the region of the incisors. The tray is now removed and a similar compound block is added to the tray in the incisor region, chilled, and the surface slightly warmed over a Bunsen flame, the tray is again placed into the mouth and seated in position under the guidance of the two posterior blocks, adjusting the entire tray about one-eighth of an inch from the ridge.

The tray is now removed and the compound thoroughly chilled. A bite block of compound one-quarter to one-half-inch in thickness is now added to the back of the tray and softened in water at one hundred and sixty degrees.

The upper impression being in position, the lower tray with bite block attached, which is thoroughly softened in water at one hundred and sixty degrees F., is now placed in the mouth and the patient instructed to close the lips, holding the jaw quiet. This brings the lower jaw in the rest position and allows about one-thirty-second-inch for correcting the strain and adjusting the lower jaw to the position of occlusion. After the compound has thoroughly cooled, the lower tray is removed and all excess compound trimmed with a knife and the occlusal surface of this bite block is now heated over a Bunsen flame to the depth of about one-thirty-second of an inch. The lower tray is again placed into the mouth and carefully seated on the ridge and the patient instructed to close the lips and swallow once. This establishes the proper bite in the position of occlusion and eliminates the strain. After the compound has thoroughly hardened the lower tray is again removed and the bite block trimmed of all surplus compound, the little compound blocks are removed from the lower side of the tray, and a quantity of compound sufficient to generously fill in the space between the tray and the jaw is now added to the tray, and shaped to the approximate form of the lower ridge, being careful that the compound is too long at the periphery. This compound is now thoroughly heated over a Bunsen flame, or with a mouth blow-pipe, being careful to thoroughly heat the compound in its deepest part, or that which comes in direct contact with the crest of the ridge. The compound is now equalized in water of one hundred and seventy degrees and placed in the mouth with the lower bite block in perfect occlusion with the upper bite block. Having the mouth wide open, the patient is instructed to place the tip of the tongue to the heel of the upper impression tray. The lower bite block is now held in perfect occlusion to the upper bite block with the thumb and forefinger of the left hand, and with the thumb and first and second fingers of the right hand, the lower lip is drawn forward while the patient is instructed to bite, at the same time releasing the lip and the bite block and asking the patient to suck and swallow at repeated intervals. The sucking and swallowing act combined with the act of closing the jaws and producing biting strain, causes the compound to flow from the sides of the lower ridge to the crest of the ridge and conforming the periphery to the base of muscle attachments on the buccal and labial sides, and to approximately the mylohyoid ridge on the lingual. If any imperfections are now found in the impressions after it has been thoroughly chilled and removed, they may be corrected by adding new compound with a tracing stick, glaze in a Bunsen flame and the impression again inserted into the mouth, instructing the patient to bite and swallow. If this technic is carefully followed, extreme stability can be attained in nearly all cases. The impression is now trimmed for contour, being careful that every part of the tray is covered with compound, because an exposed tray produces strained tissue and would result in an uncomfortable denture.

The periphery of the rim on the buccal side should now conform to the external oblique line or the point of muscle attachment, and should be stable when the patient opens the mouth wide or when the lips and cheeks are drawn outward. If this is not the case the rim may be trimmed with a knife until it approximates that position and then reheated in sections, placed into the mouth, and have the patient suck under biting pressure.

Having completed the lower impression, we now proceed to correct the upper correctible impression.

The rim of the upper impression is now cut short of all muscle attachments on the left side from the first molar to the median line, the cut surface slightly glazed over the Bunsen flame and soft compound added to the rim. This compound is now glazed in the Bunsen flame, being careful not to heat the compound in the vault, since that is the key which guides the impression into proper position. Temper the heated compound in water one hundred and sixty degrees, insert the right side of the tray well into the mouth with the left hand distending the lip on the left side, turning the tray in the mouth, and seating in position. The patient is now asked to bring the lower jaw into occlusion and produce biting pressure, at the same time moving the lips forward and backward and causing a slight negative pressure by sucking.

The compound is now allowed to pass from the flowing state into the molding state, that is, when the compound can be bent without changing form, and slight pressure is brought to bear at the extreme edge of the rim to compress the soft tissues overlying the base of muscle attachment. The impresson is now chilled in the mouth with cold water and removed. All excess is carefully trimmed with a knife, leaving a rim as indicated in the case. The compound rim on the right side is now cut short the same as on the left side and treated in a similar manner, reversing the technic when placing the impression in the mouth. The compound rim in the region of the molars and tuberosities is now cut short with a knife and fresh compound is added with a tracing stick and across the heel of the plate as far forward in the vault on either side of the median line as the tissue is movable. The entire compound traced over the tuberosities and the heel is now glazed in the Bunsen flame, being careful to glaze the compound a quarter of an inch anterior to the compound added on either side of the median line in the vault. The glazed compound is now tempered in water at one hundred and sixty degrees and the impression is carefully placed in position in the region of the anterior six teeth, being sure that the heel of the impression does not touch the vault. The impression is now held in this position with the middle finger of the left hand and the patient is asked to close the lips and swallow. While the patient performs this act firm pressure must be exerted upward and backward with the middle finger, assuring a firm seating of the impression in the incisor region. When the patient bites together the upper impression is forced up at the heel and the added compound forced to flow backward, properly displacing the movable tissue on either side of the vault and taking a perfect impression of these tissues in a closed mouth position. The patient is instructed to move the lips forward and backward to muscle-trim the rim of the impression, and when the compound has changed from the flowing to the molding state, slight pressure is brought to bear at the periphery of the added compound to compress the soft tissue overlying the base of muscle attachment in that area. The compound is now thoroughly chilled with ice water and the impression carefully removed. All surplus is trimmed with a knife and the impression thoroughly chilled in ice water. The impression is now reinserted in the mouth and if all steps have been properly carried out the impression must test for stability in all positions, and must defy dislodgment by any voluntary act of the patient.

The movement of the lips forward and backward in taking the full upper impression is very essential, in order to get the formation of a rim that allows the free action of the muscles in all positions. It forms a rim to a form of comfort where a denture will be tolerated without impairing the free movement of the lips and cheeks and not produce soreness.

The median line is now established, the high and low lip line marked, positions of the cuspids outlined, and the impressions are complete for running the cast.

TECHNIC FOR TAKING FULL UPPER PLASTER IMPRESSION

Select a tray of suitable size and heat S. S. White Tray Compound and mould same into tray to the approximate formation of the jaw. Glaze the compound in a Bunsen flame, temper in water at one hundred and sixty degrees, and insert into the mouth under slight pressure, being sure that the impression extends beyond the vibrating line, and producing a well-formed rim. After the compound has thoroughly cooled, remove the tray with compound and you have formed a snap impression which is now trimmed and removed from the tray. The metal tray is now discarded and the compound impression serves the purpose of the tray. This compound tray is now placed into the mouth and tested for height of rim. If this rim does not clear all muscle attachments, the rim is heated over the Bunsen flame on one side only, tempered in warm water, inserted into the mouth, and muscle trimmed by forcibly distending the muscles of the cheek with the left hand, while holding the tray firmly in position with the right hand. Allow to cool and remove. If this step has been performed properly, the rim will be on a line with muscle attachment and proceed to the opposite side and treat it in the same manner. It is important that the entire rim is properly trimmed to muscle attachment.

Next, place a small quantity of soft plaster at the heel of the impression only and place into the mouth, allowing plaster to harden. Remove tray with plaster and wipe the posterior part of the vault with a salt solution on cotton to remove mucus, with an indelible pencil make a mark in the vault at the junction of the vibrating and movable tissue or the *foveola palatina* which indicates the length of your plate at the heel. Before allowing the patient to close the mouth re-insert the compound tray with the thin plaster layer at the heel, slightly moistened, and firmly seat into position. On removing, the indelible pencil mark will be transferred on the plaster in the impression tray indicating the length of the tray. With a knife trim the heel to a point indicated by the indelible pencil mark and remove plaster. The impression is now post dammed by tracing Kerr's Modelling Compound over the heel of the impression with the tracing stick, slightly warmed to flow under pressure and yet compress soft tissue; the tray is firmly seated in position with the mouth closed as much as possible and allowed to cool. Trim away all surplus at the heel, also trim the entire rim to the thickness of about one-sixteenth to one-eighth-inch and then remove about one-sixteenth of an inch from the entire rim of the tray. In other words, shortening the rim one-sixteenth of an inch. This is done for the reason that we want perfect clearance of all muscle attachments and providing body for our plaster.

Next, scrape freely over all hard areas in the vault and in the region of the palatine vessels. The compound tray is now ready for receiving the plaster wash. Before proceeding to this step the patient must be instructed to keep all lip and cheek muscles perfectly relaxed. The plaster wash is made by placing tepid water in a plaster bowl in which is dissolved a small portion of potassium sulphate and then carefully sift into this solution Kerr's Snow White Plaster. The sifting is very essential to eliminate any hard particles of foreign matter insuring a smooth mixture of plaster. The plaster is then thoroughly stirred until the proper consistency is reached which varies with the case in hand. For an ordinary impression for the upper jaw it should be stirred until it shows the first signs of setting, or when you can stir it without making any perceptible noise. When this consistency is reached it is quickly poured into the moistened impression tray, being careful to cover every part of the tray with plaster, then shaking out the excess and seat the tray into the mouth with a vibratory motion, at the same time raising the lips to see that the tray is properly seated and no air entrapped, hold the tray firmly against the vault to insure proper compression of the soft tissue at the heel. When the plaster has reached the molding state the lips and cheeks are massaged to proper contour while the patient's mouth is practically closed. This is an important step for the proper formation of the rim of the plate from a standpoint of contour. Allow the plaster to thoroughly harden and remove. The relief for hard spots in the vault may at this time be outlined with an indelible pencil and the impression re-inserted into the mouth to copy the pencil tracing. These tracings can now be outlined on the impression with the point of a sharp instrument which will subsequently be copied in the cast and are referred to later.

TECHNIC OF TAKING LOWER IMPRESSION

Select any lower impression tray that will approximately fit the mandible. Cut a piece of No. 10 iron or brass wire and form it to the shape of the tray. This wire is laid into the tray and S. S. White Tray Compound is softened in hot water and attached to the tray over this wire. The purpose of the wire is to strengthen the compound tray which is to be formed. Shape this compound into the approximate shape of the mandible, glaze over a Bunsen flame, temper in hot water, and take an impression of the lower mandible. Allow to cool and remove. Remove the compound impression from the tray and we have the wire imbedded in the compound impression which will now be considered the correctible tray. With a knife trim away all surplus and heat one side of the buccal and labial rim in the Bunsen flame, temper in hot water and insert into the mouth, and while holding the tray firmly in position with the right hand distend the buccal and labial muscles with the left. After thoroughly cooled, remove and treat the left side in a similar manner. With a knife trim the lingual rim to the mylohyoid ridge or one-thirty-second of an inch below, and the rim in the anterior part is softened in the Bunsen flame, placed into the mouth and the patient directed to extend the tongue forward as far as possible and moving it sideways. This trims the rim to the muscle attachments in this region.

Next remove one thirty-second of an inch of the buccal and labial rim with a knife so as to give these muscle attachments free action and room for bulk of plaster. Trim the entire impression tray to suitable form, leaving sufficient compound in the incisor region to serve as a handle for carrying the tray into position.

Having properly formed the tray it is now ready to receive the plaster. The plaster is mixed in the same manner as described for a full upper with the exception that the consistency is slightly stiffer. The tray is filled with plaster and well seated on the lower mandible, and in seating, the cheeks and lips are well drawn outward. Then by keeping the impression in position with one hand, the cheeks and lips are massaged for contour with the other hand and as the plaster attains the molding stage the patient is instructed to extend the tongue until it touches the lower lip. This produces a lower impression which is properly contoured and has properly-formed rims.

BOXING THE IMPRESSIONS

After the impressions are dry they are coated with a thin solution of shellac in alcohol. This coat is allowed to dry and serves to fill in the pores of the plaster. Then a coat of Sandarac varnish is applied and allowed to dry. A mix of ordinary plaster is now made and the impression is imbedded into it to a point of about one-sixteenth of an inch from the rim of the impression. When the plaster has hardened it is trimmed down to one-quarter of an inch thickness. To ascertain a uniform height of the plaster boxing, it may be supplemented by adding soft wax which can be more readily trimmed to a definite line.

Next, wrap a strip of either block tin or base-plate wax around the plaster boxing to a height of at least one-quarter to one-half inch above the highest point of the impression and seal securely with a hot spatula. This now forms a box into which the cast material can be placed, giving the cast a better form and proper bulk. The boxed impression is now thoroughly soaked in water. This is very essential for the reason that dry plaster will absorb a certain amount of the moisture from your cast material producing an imperfect cast. The impression is now given a thin coat of soap, which is in turn partially flushed out with water.

The two materials best suited at the present time for casts are Spence's Plaster and Weinstein's Calsilith. Spence's Plaster is mixed to a very stiff consistency by repeatedly adding powder until it becomes crumbly under vigorous kneading. The soaked boxed impression is now placed on a vibrator or jarred by hand and the Spence's Plaster is placed into it in small quantities and caused to flow under vigorous jarring or vibrating, new plaster being added until the impression is completely filled. A Spence cast must set for four hours before it is ready for work. To make a cast out of Weinstein's Calsilith prepare the boxed impression in the same manner as described for the Spence cast. Mix the Calsilith to the consistency of a thick cream or to a point where it does not flow. Remove a quantity of it and incorporate more of the powder until a consistency of a heavy putty is reached. With a stiff brush paint the impression with a thin coat of the softer mix and then carefully pack the stiffer mix into the impression, being careful not to entrap any air. Then cover and fill the rest of the cast with the softer mix, being sure to completely cover all of the stiffer mix. In this way you equalize the moisture of the soft and stiff mix, forming a uniform mass. A Calsilith cast can be trimmed after four hours, but should not be worked upon until eight hours have elapsed. When the casts are thoroughly hard the wax or metal boxing rim is removed, the plaster boxing is cut away, and the impression is carefully removed from the cast.

If properly formed, the cast will reproduce the exact formation of the rim of the plate and the heel, with a body of material one-quarter of an inch thick all around the rim.

At this point provision must be made for proper relief in the upper plate, which is outlined on your cast by the tracing on the impression. The proper amount of relief must be judged by the amount of soft compressible tissue surrounding the hard area and can be made by either properly forming a relief of block tin or using a number of thicknesses of No. 60 tinfoil, or a number of thicknesses of adhesive tape covered with a sheet of No. 60 tinfoil.

The cast properly relieved, it is now covered with a sheet of No. 10 tinfoil properly adapted. Over this a Graft's or Dentsply base plate is adapted to produce the perfect form of the rim and sealing it to the tinfoil. The purpose of the tinfoil is first to protect the cast from abrasion and second to protect it from the wax, at the same time it is more pleasing to the patient.

To the lower cast, No. 60 tinfoil is carefully adapted over which Mellot's Metal is flown in a moulten state, to serve as a reinforcement with the added advantage of weight.

To these base plates is now formed a rim of wax to the proper contour of the arch and the approximate length of the teeth which serves as a bite block. The upper base plates with the bite block attached are now placed into the mouth and the length of the teeth marked, which usually is indicated by the length of the lip when at rest or a millimeter below. The occlusal plane of this bite block is now formed parallel to a line drawn from the corner of the mouth to the lobe of the ear. The upper base plate is now removed and the lower base plate is placed into the mouth. The anterior part of the lower bite block is now trimmed down to a point even with the lower lip at rest, while the wax bite block is left higher at the heel inclining toward the front in a straight line. This is now removed and we have our upper bite block and the incisal portion of the lower bite block trimmed to a length indicating the rest position of the jaws.

The wax of the lower bite block in the region from the molars to the central incisors is now pooled with a hot spatula leaving a rim of supporting wax on the outside. When this is in a slightly-congealed form and the upper base plate with bite block attached is in position, place the lower base plate into the mouth, instruct the patient to touch the heel of the upper base plate with the tongue and close the jaws. This will allow the jaws to come together in their most retruded position until the upper bite block strikes the hard wax in the lower bite block in the region of the central incisors, while the upper bite block sinks into the soft wax of the lower bite block at the heel. Allow this to cool and remove. Remove all surplus wax on the lower bite block and in the region of the central incisors cut away a strip of wax the thickness of about one thirty-second of an inch, which indicates the difference between the jaws in the rest position and the position of occlusion.

Again pool the wax in the region of the molars and as far forward as the central incisors, and with the upper base plate in position place the lower bite block in position and have the patient bite together in a similar manner. We have now established the proper relation of the upper and lower jaw in the position of occlusion. On these bite blocks mark the median line, the high and low lip line, and the position of the cuspids, which is in a straight line drawn from the corner of the eye to the *alea* of the nose. With a knife cut a line at right angles to the occlusal plane in the region of the molars and cuspids to insure correct relations, remove the base plates from the mouth and seal together with a hot spatula.

The casts are now placed into the base plates and sealed with wax and the case is ready for mounting on the articulator.

At the present time we are using the Gysi Simplex Articulator.

MOUNTING ON THE ARTICULATOR

Be sure that all lock screws are tight and the arms of the articulator in proper position with a guide pin flush with the upper arm, and the incisor guide in the correct position. Place a quantity of Mellott's Mouldine or molder's clay on the lower arm of the atriculator, which serves as a rest for the case and on which you can adjust the case in proper position on the articulator. The incisor guide must touch the base plates at the intersection of the median line with the lip line, and the occlusal plane must be in line with a line drawn from the notch in the lower arm and the incisor point. And the heels of the cast must be equidistant from the sides of the articulator.

The upper cast is now partially coated with shellac varnish to allow the easy removal of the cast when ready to detach, and is attached to the upper arm with plaster. When this has hardened the articulator is reversed and the lower arm is fastened in a similar manner.

The articulation of full upper and lower dentures is outlined in complete form in Dr. Clapp's Prosthetic Articulation, and would refer you to a careful study of the same.

WAXING

After the teeth are anatomically articulated the waxing is a very important part of the technic in determining the form and thickness of your denture. If properly done it also eliminates a great deal of filing and scraping. Carve the wax on the labial and buccal surfaces to the approximate formation outlining the proper carving you intend to reproduce in the denture, being careful to add sufficient wax at the necks of the teeth for perfect form. The lingual surfaces of the teeth are to be carved to the true form of the natural teeth down to the base plate. This gives a plate formation of uniform thickness up to the necks of the teeth. The rugæ and inequalities of the vault want to be reproduced and retained in the finished denture. Clean all wax from the teeth and clear the interproximate spaces with waxed silk floss.

Next, tinfoil the palatal surface with two separate sheets of tinfoil No. 60. If the tinfoil is carefully adapted the palatal portion of the denture will require no further attention than buffing with a cloth wheel and whiting.

The lower case is waxed to proper dimension and carved to correct form, and the wax glazed with an alcohol flame.

FLASKING

The cases are now removed from the articulator, the cast trimmed to fit the flask and soaked in water. A putty-like mix of Spence's Plaster and French's Plaster, equal parts, is now made and placed in the lower part of the flasks into which both upper and lower cases are firmly seated and properly adjusted in relation to the flask.

The case is trimmed when hard to eliminate any undercuts, being sure that all sides are tapered to allow ready separation. If there is any doubt, a thin layer of wax may be flowed over such surfaces where fracture might otherwise result. The upper half of the flask is now fitted to the lower half, being sure that they meet perfectly. The case is now given a coat of shellac, the upper ring placed in position, and the labial and buccal surfaces are covered with Kerr's Snow White Plaster to the occlusal and incisal third of the teeth. This is done to insure perfect vulcanization of the pink rubber which is not possible when in contact with Spence's Plaster. After the Kerr's Snow White Plaster has partially set, the rest of the flask is filled full of Spence's Plaster. The Spence Plaster gripping the incisor tips of the incisors and cuspids and the occlusal surfaces of bicuspids and molars, reduces the chance of movement of the teeth under vulcanization to a minimum.

The lower case is flasked in a similar manner as the upper with the exception that Kerr's Snow White Plaster is placed on the lingual of the lower denture in addition to covering the labial and buccal surfaces. When the flask is filled place it in a press and apply slight pressure, allow to harden. To separate the flask it is essential that just enough heat is applied to soften the wax sufficiently to separate without melting it, thereby insuring casts that are free from wax. This is best accomplished by placing the flask in a dish of cold water and bringing it to a slow boil. When that point is reached the flask is immediately removed and is ready for separation. The same result can be accomplished by placing the flask in water of one hundred and twenty degrees temperature and leaving it in that water for fifteen minutes. When the flasks are separated, remove all wax carefully and clean up the case for packing the rubber. The upper part of the flask is now placed over a Bunsen flame and heated. The labial and buccal surfaces are given a coat of collodion, and the case is ready for packing the rubber in the usual way. It is a good policy to pack the case a trifle short of the proper amount of rubber. Then place No. 4 tinfoil over the cast, moistened cambric over the rubber, and close the flasks under pressure in boiling water. When the flasks are closed, separate and remove cambric and tinfoil. The shortage of rubber can then be determined and new rubber added. The flask is again closed in a similar manner and opened for final inspection. Any corrections in the quantity of rubber can now be easily made, the cast is carefully tinfoiled with No. 4 tinfoil, which is thoroughly covered with soap suds, and the flask closed ready for vulcanizing.

VULCANIZATION

Slow vulcanization is better than too rapid vulcanization, and the time depends largely upon the thickness of the case. The time of vulcanization is usually described by the rubber manufacturers, which is best suited for their rubber for the ordinary thin case; but if the case is very heavy other precautions are necessary. It is essential to reduce the temperature and increase the time. It is also advisable to either pack old vulcanized rubber in the form of small pieces or coarse filings or pink rubber in the heavy portion, leaving an outer covering of the regular base rubber thin enough to properly vulcanize, eliminating all possible chance of a porous plate. About three ounces of water are poured in the vulcanizer and a metal block high enough to clear the flasks of water is placed in the bottom of the vulcanizer. The flasks are then put in and vulcanizer closed. The air valve is opened. When a few drops of water appear at the valve, it is closed and the temperature raised to two hundred and twelve degrees F. Reduce the gas flame so it will take forty-five minutes to raise the temperature to three hundred and fifteen degrees F. and then hold that temperature for an hour and fifteen minutes.

It is well to remember that for every five degrees the temperature is lowered, the time must be increased fifteen minutes. When vulcanization is complete it is important that the case be allowed to cool slowly, and under no conditions remove the plates before they are cold.

TRIMMING AND POLISHING

When cases are prepared in this careful manner there is very little trimming and no scraping necessary. The slight featheredge surplus can be readily trimmed with a knife, the length and rim of the plate is perfectly formed and does not want to be touched. With suitable chisels the necks of the teeth are carefully carved, the rubber is cleared out between the teeth with a Number 1 bur, ground to a fine point, and with a Blue Island Dental Specialty Company bud bur, any gum festooning that is desired may be made. The tinfoil is removed from the palatal surface and the case is ready for the polishing. A good polishing mixture is pulverized pumice stone with a little Number 80 grit emery powder and a little oil added. For polishing surfaces on the labial and buccal a six-inch cloth wheel is very efficient, the effectiveness of which can be increased by using the various speeds. The interproximal spaces are carefully polished with single-row brush wheels, directing the center of the brush on the tooth itself and allowing the stray bristles to carry the pumice into the interproximal spaces. Cup-shaped brushes used in the chuck mandril are very efficient to polish around the necks of the teeth. A final polish is now given with a soft flannel wheel or a stiff brush, charged with whiting. The rim of the plate is also polished to a smooth surface without changing the form of it. The tin foil, on the inside of the plate can be easily removed and the plate should be carefully examined for any roughness on its surface, which is carefully removed and polished.

It is very important that the inside of the plate has no projecting particles of rubber since that would interfere with the stability of the denture besides causing unnecessary irritation.

The lower denture is treated in the same manner.

The dentures are now ready for inserting into the mouth for the test bite. This is necessary because various changes may have taken place while passing through the steps of flasking and vulcanizing. To take the test bite place the upper denture into the mouth. Attach soft wax to the occlusal surfaces of the teeth of the lower denture and soften this wax in warm water. Insert the lower denture into position, ask the patient to place the tip of the tongue to the heel of the upper denture and close until they slightly touch. Repeat this act several times to be sure of the proper bite. Remove, seal upper and lower dentures firmly together, remount in the articulator and putty grind with carborundum powder mixed with glycerin or K. Y. jelly. The grinding should be continued until the teeth slide smoothly over each other in a definite path, both in the retruded, normal and protruded positions.

The cases are now removed from the articulator and delivered to the patient. It is necessary to carefully watch all denture cases to correct any changes that may develop and make such adjustments to the soft tissues as are indicated.

The lingual rim of the lower denture should extend only to the mylohyoid ridge and the buccal rim to the external oblique line or the point of muscle attachment.

RE-FITTING OF FULL UPPER DENTURE

The re-fitting of a full upper denture is necessary where resorption of the ridge has taken place, which is usually on the buccal and labial sides of the ridge. Clean the denture carefully and remove all fatty deposits with alcohol and thoroughly dry. With a modeling compound tracing stick trace compound on the inside of the rim confining it to the upper two-thirds of the rim. Also trace compound on the heel of the plate in the region of soft movable tissue. Glaze over a Bunsen flame, temper it in water of one hundred and sixty degrees, and insert into the mouth, seating it carefully to the ridge in the region of the six front teeth. Ask the patient to close and bite the heel into position. This again insures an impression of the tissue with the mouth closed, producing a compression of the soft tissue overlying the base of muscle attachment

While the compound is still soft ask the patient to move the lips forward and backward and produce a sucking motion. When thoroughly cooled, remove.

To take an impression now of the fine detail of the jaw place a very thin wash of Kerr's Snow White Plaster into the plate, insert into the mouth, have the patient close and produce ordinary biting pressure. After the plaster has hardened the plate is removed and the plaster properly trimmed. The plaster is now given a coat of shellac and sandarac. A rim of wax about one-quarter of an inch wide is now sealed around the entire rim of the plate and across the heel. A sheet of wax an inch wide is wrapped around this wax, producing a box for running the cast. The cast is run in the usual way with either Spence's Plaster or Weinstein's Calsilith. When the cast is thoroughly set remove the boxing and trim. The teeth are now removed from the vulcanite by directing a pointed flame onto each tooth until the rubber is warmed sufficiently to release the tooth. After all teeth are removed any remaining rubber is cut out either with a bur or dissolved in chloroform. The dovetailed rubber in the sockets is carefully cut out with a bur, being careful not to disturb the seat of the tooth so that the tooth can again be placed into perfect position in the plate. Where pin teeth are used, the rubber is cut away in the region of the pins with a bur or file. All teeth must release their sockets freely and are sealed into position with hot wax. A thin layer of wax is now flowed over the entire buccal and labial surfaces of the denture and the palate portion is tinfoiled with number sixty tinfoil. The case is now flasked and separated in the usual manner. On separating, the teeth will be in the upper part of the flask and the rubber plate in the lower part of the flask, covering the cast. The rubber plate is now removed by directing the flame of a blow pipe onto it until the rubber softens, which can then be easily pulled off. The cast is now cleared of the remaining compound and plaster and the case is rubber-packed in the usual manner.

This technic produces a new plate of wonderful efficiency and comfort, and if the technic is properly followed there will be absolutely no change in the position of the teeth.

RE-FIT FULL LOWER DENTURE

To attain the greatest amount of efficiency in a lower denture, a re-fit is always indicated to produce uniform bearing upon the hard and soft tissues when under biting stress, relieving the strain on the top of the ridge. To accomplish this result the lower plate is carefully cleaned with alcohol and thoroughly dried. With a modeling compound tracing stick trace the compound along the rim of the plate only and across the heels. The amount of compound used depending upon the resorption and the thickness of the soft tissue to be compressed. It is very important that no compound be traced in the region of the top of the ridge for the reason that the compound is to flow from the sides to the crest of the ridge, favorable displacing tissue. With an alcohol flame this compound is now glazed and tempered in water at one hundred and seventy degrees. The lower denture is now gripped in the region of the central incisors with the thumb and forefinger of the right hand and placed into proper occlusion with the upper denture. The thumb and forefinger of the left hand now grip the lower plate at the rim in the region of the second bicuspids and held in occlusion. Now release the right hand and with it distend the lower lip forward. Direct the patient to place the tip of the tongue to the heel of the upper denture and close, swallow and suck vigorously, producing normal biting pressure.

The compound is now thoroughly chilled and removed, all excess compound carefully trimmed and any imperfections corrected. The lower denture is now placed in the mouth, and if the adaptation has been made correctly it will have attained a surprising suction and stability. The lower denture is now ready for flasking. Select a suitable flask and in the lower half imbed the denture in a mix of half Spence and plaster, to within one thirty-second inch of the rim of the plate. This must be carefully done and the plaster trimmed to a definite line being careful that no undercut exists so the flasks may be easily separated. The compound is now given a thin coat of Sandarack Varnish and the plaster is well coated with shellac. Spence's Plaster is now mixed to a crumby consistency, the upper half of the flask placed in position, and the Spence plaster placed into the impression under vigorous jarring, filling the entire flask. When the Spence Plaster has hardened for four hours, the flask is placed into water at a temperature of one hundred and twenty degrees and allowed to remain for fifteen minutes. The flask is now separated and the compound can be readily removed. The cast for the lower denture is now in the upper half of the flask and the lower denture remaining in the lower half of the flask. The entire rim of the lower plate is now cut down about one thirty-second of an inch and an equal amount of rubber is cut from the entire surface of the plate. This is done to allow for body for the second layer of rubber. With an inverted cone bur, dovetail the entire rim and surface of the plate by sinking the bur into the rubber. The case is now ready for packing in the usual manner. The cast is tinfoiled with number four tinfoil, thoroughly covered with soap suds, and the flask closed, ready for vulcanizing.

When vulcanized the little surplus rubber is trimmed, scraped and polished.

Carbolic Acid

The anesthetic qualities of carbolic acid used under pressure (anesthesia) for the extirpation of exposed pulps in all teeth, is entirely satisfactory. I experimented with this drug when pressure anesthesia was first introduced and never have used a cocain tablet where there is exposure with equal success.—*Burchell Benbow, Commonwealth Dental Review.*

For Children's Teeth and Some Temporary Fillings

When using oil of cloves and zinc oxid in children's teeth, it is sometimes desirable to have the filling retained for several weeks. By incorporating a few strands of cotton in the mixture of oil of cloves and zinc oxid, the resulting filling will give much longer service than when the mixture is used in the usual way.—*Dental Digest.*

EDITORIAL

THE ANESTHETIST

This is an age of specialization. For years the medical profession has had its specialists in many branches of the healing art, and the dental profession has had its Oral Surgeons and Orthodontists, but within a recent number of years there have delevoped within the dental profession specialists in Dental Prosthesis, Periodontia, Exondontia, Pediadontia, Radiadontia, Oral and Dental Diagnosis, and now comes the specialist in Anesthesia.

Anesthetic organizations have been formed in many sections of the United States and some of the best men in the medical and dental professions are working for the advancement of good anesthesia. Not many years ago, the administration of an anesthetic was left to most any one, a nurse, medical student, family doctor, and no attention was paid to it from a scientific standpoint. But the day is passing when everybody will be permitted to give the anesthetic, for recent advances in this branch has made it a special practice worthy of our recognition.

Dr. S. E. Earp, editor of the *Indianapolis Medical Journal* says:

"The special anesthetist, the man who has given long time and study to the perfection of his knowledge of this work, is among us and his presence is being felt. The technician in the administration of any anesthetic agent, he who has mastered the mechanics of it, and has gone no further, cannot be called an anesthetist. The anesthetist of the future shall be a physical diagnostician and shall be able to assist the surgeon in the selection of the anesthetic to be used and the manner of its application. He shall be able to assume all responsibility for the anesthetic. It is not uncommon even now for the surgeon to leave the selection and the administration of the anesthetic entirely to the anesthetist. The surgeon wants none of the responsibility of this work, where he can crawl from under it. It is the anesthetist in the future who shall take the bad surgical risk and develop it into the safest possible one for the condition. Patients who are to be denied operation because of their inability to take a general anesthetic will be but few in number."

The anesthetists in a number of large cities already have organized locally, and just recently announcement was made of the launching of The National Anesthesia Research Society, with the avowed purpose of collecting data and prosecuting original research in this field. The objects of the society as set forth in the constitution are:

"To promote the science of anesthesia and to enable its members, after first having obtained the approval of the Society, to submit without prejudice to the dental and medical professions, any views, findings, or accomplishments they have attained; to obtain from all available sources such information as is now extant concerning any material, liquid or gas, known to have anesthetic properties; to arrange, in cooperation with dental, medical, and anesthesia associations for the preparation and delivery of suitable interesting and educational papers on the general subject, or relative to some particular anesthetic; to use influence to prevent the publication or circulation of any false or unauthentic statements concerning any and all conditions, symptoms, or phenomena prevailing during or after anesthesia by any anesthetic, and to prepare and distribute on request, forms on which such information can be tabulated with uniformity; to distribute by pamphlet or publication, as its funds may permit, and its governing powers authorize, such reliable data as it may collect or obtain through its members or others interested in the subject of anesthesia, for use by the medical and dental professions; to cooperate with state authorities and other bodies in the preparation of suitable legislation to safeguard those to whom anesthetics are administered as well as those called upon to administer them; to use its influence in every way and to give its aid toward the advancement of the Science of Anesthesia."

The Research Committee, which will have supervision of original work and the editing of material designed for the profession and the professional press, is headed by F. H. McMechan, A.M., M.D., Avon Lake, Ohio, Editor of the Quarterly Supplement of Anesthesia and Analgesia, *American Journal of Surgery*, who has been made chairman, and W. I. Jones, D.D.S., Columbus, Ohio, president of the Inter-State Anesthetists' Association, who was elected secretary.

Representative anesthetists of the country, who have distinguished themselves by research and progress in their field, are being invited to join the committee. The society has been endowed with limited funds which will permit it to demonstrate that there is a field of usefulness for it.

It is a laudable undertaking, for the science of anesthesia has been sadly neglected, and should result in great benefit to the dental and medical professions and to the community at large. THE DENTAL SUMMARY will from time to time give its readers the benefit of the findings of this organization.

To SUMMARY Readers:

In reading every paper printed in this magazine every month, always twice and not infrequently three times, I have been struck with the forcefully positive manner used by many of the writers, even upon subjects admittedly in grave dispute among the very best of our so-called authorities. For instance, some writers unhesitatingly credit streptococcus viridans with responsibility for most of the ills to which we all are liable, while others unhesitatingly declare and prove that streptococcus viridans is a normal inhabitant of the buccal cavity, always present from birth to death except during periods of infective illness caused by the invasion of some other bacterium in overwhelming numbers, and that injections of streptococcus veridians never have produced the diseases credited to it, nor anything remotely resembling them.

All of this suggests the necessity for caution in accepting, and, particularly, in acting upon half conclusions advanced as gospel truth, and of bearing in mind that nearly all sciences, so-called, are theories, and that theory, however plausible, is little better than guess work. One of the greatest minds who ever ornamented the study of science gave to the world this definition: "A scientific theory is only a shrewd guess, to be accepted only until some other student makes a better guess."

Such being the case, the best advice I have to offer, quite unasked, is: Read much; think more; decide for yourself in full recognition of your responsibility as professional men entrusted with the preservation of human health and life.—*G. E. H.*

OBITUARY

Dr. Harry Howard Avery

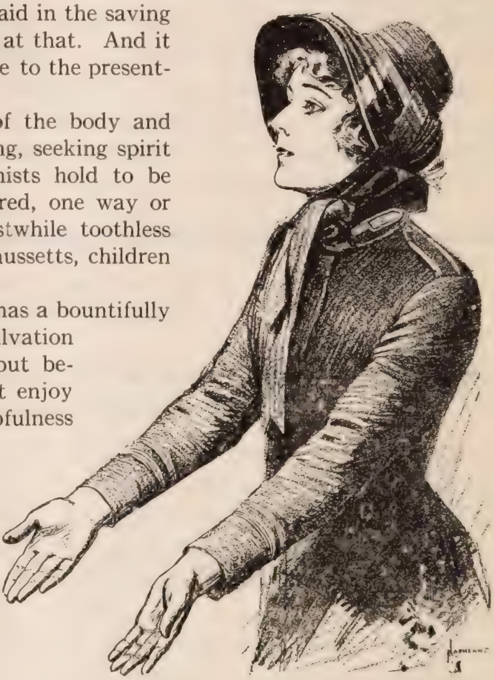
Dr. Harry Howard Avery died Wednesday, February 18, 1920, at his home in Chelsea, Mich., following a long and painful illness which he bore with remarkable patience. Aged 53 years and 16 days.

Dr. Avery came from a long line of illustrious ancestors, "the Grotan-Avery clan," who were prominent in the early history and developement of the United States. His parents were Henry Eston and Harriet (Sprague) Avery, well known and highly respected residents of Marion township, Livingston county, where deccased was born, February 4, 1867. There he grew to young manhood on a farm and by thrift and industry accumulated the funds necessary to permit of his entering the dental department of the University of Michigan, from which he was graduated in 1891. Soon afterwards he located in Chelsea, which place had since been his home and where he had continued to practice until about two years ago. He was a member of the State Dental society, of the Royal Arch Masons, the O. E. S., Knights of Pythias, and of the Chelsea Methodist church.

He was united in marriage with Miss Ida Estella Whitaker, in Jackson, October 22, 1890, who is left with one son, Arthur Henry Avery, to mourn their loss. His mother, Mrs. Henry Avery, of Howell, two brothers, Dr. Ernest Lee Avery, of Howell and Cassius Bruce Avery, of Duluth, and one sister, Mrs. Frank Bailey, of Plymouth, survive him also.

SALVATION
ARMY
HOME SERVICE
FUND
1920

Teeth for the Good of the Soul



Here's a new call to the dentist to aid in the saving of souls. It's a purely professional call at that. And it proves there's a strikingly practical side to the present-day work of salvation.

Good cheer, good living, health of the body and mind, and the gripping power of a living, seeking spirit of helpfulness—all these the Salvationists hold to be good for the soul. And all these figured, one way or another, a few days ago when an erstwhile toothless mother of nine lusty Roxbury, Massachussetts, children received a complete set of teeth.

At this mother's home last Christmas a bountifully filled basket of food was left in the Salvation Army's annual Yuletide distribution; but because of her lack of teeth she couldn't enjoy the feast. So the Salvation spirit of helpfulness promptly found work for the dentist.

The teeth were made by Dr. Fred Rollins, a member of Tufts dental college faculty, and chief surgeon now in the dental clinic of the Salvation Army's recently opened "poor man's" hospital in Boston.

In peace, as it was in the war, the Army is unselfishness organized and on the alert. In caring for the world's unfortunates, for the poor and the wretched, it is quick to adapt its methods and means to changing needs.

High wages and national prohibition put an end to its work among victims of drink. Now it is turning its homes for inebriates into homes for the rescue and cure of drug addicts. It is going earnestly into the fight against this newer, more terrible evil.

And meanwhile it must carry on along all its other battle lines in the warfare against wickedness, sickness and distress. It must maintain and add to its one hundred industrial homes in the United States, its seventy-five hotels for men and women, its homes of various kinds, its nurseries and slum settlements for welfare work among children.

Its greatest and most urgent call to the dentist—not the professional one just mentioned by any means—is voiced in its general call for the means to keep up this nation-wide work of helping and saving children and women and men.

The Salvation Army will make its appeal from May 10 to May 20. It needs more generous support than ever before, for it is facing its heaviest year of unselfish labor.

SUGGESTIONS

CONDUCTED BY F. R. CHAPMAN, M.S., D.D.S., COLUMBUS, OHIO

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

Correctly Locating on the Base the Source of Irritation

Remove the denture and dry with a towel; take an ordinary postage stamp, or better still, one of the Christmas stamps sent out in the interests of the Dentists Relief Fund of the National Dental Association, and cut a piece about two millimeters square. With a pair of cotton pliers moisten the gummed side on the patient's tongue, as you place it upon the mucosa at the point of irritation, gummed side up. Place the denture into position carefully, press firmly to place and remove. The piece of stamp will be found adhering to the base at the point where correction is needed. The most important phase in this procedure is the thorough drying of the base.—*D. D. C.*

Adding Single Tooth to Partial Plate

Many times it is necessary to add a single tooth to a partial rubber plate, and many times the rubber extending over a wide ridge will break without reinforcement.

To make this reinforcement for pin tooth attachment, I take an eighteen-gauge clasp wire of proper length to make it double, reduce the size of the ends by filing one-fourth inch back to size suitable to fit around the tooth pins, then by bending the wire in shape of hairpin, and the ends at right angles towards each other in shape of open eyelets, this fitting around the neck of the tooth pins, making the hair-pin bend so there will be a spring inward, this clamping of the pins sealed by vulcanite will give an excellent reinforcement.

For a diatoric tooth the wire can be used in the same way, but bent at right angles laterally to enter large opening in porcelain tooth, then again at right angles outwardly to enter the small holes in the tooth, making the hair-pin to spring outward instead of inward; pins thus spring into the diatoric tooth, and when sealed by vulcanite, give required reinforcement.—*E. A. Thomas, Hastings, Neb.*

Conservation of Your Charcoal Block

The dentist who melts small nuggets of gold with the use of an open flame finds that nothing surpasses a charcoal block as a receptacle for this purpose. If the bare charcoal block is used it burns away so fast that replacing it causes needless expense as well as a great deal of inconvenience.

Cut from the end of your charcoal block an inch and a half or two inches; stand on end and encase in a plaster-retaining wall about three-fourths of an inch in thickness. This wall may be trimmed down as the charcoal is consumed.

Don't make the mistake of using investment instead of plaster. Mix the plaster thin and saturate the block with water before imbedding. Wait until perfectly dry before using.—*Dayton D. Campbell.*

Gold Fillings in Artificial Teeth

Gold fillings may be employed to splendid advantage in obtaining an effect of naturalness in artificial teeth. This advantage, however, is to be secured through the exercise of judgment in placing these fillings, while the superior advantages are assured to the prosthetist who displays a superior artistic ability. Briefly, the fillings should be placed in the same mesio-distal relation as would be required in the decayed natural teeth.

If Black's Cavity Outline Form, in that approximal classification which does not involve the incisal edge, be followed, the artistic results will be greatly enhanced.—*Dayton D. Campbell.*

Preparing Cavities in Artificial Teeth

The safest, most rapid cutting and most economical instrument employed in our laboratory for cutting cavities in artificial teeth, is the No. 175 Grit C carborundum point for porte polisher. This may be sharpened as often as necessary by holding against a flat carborundum stone.—*Dayton D. Campbell.*

Fire-resisting Screens for Burning Out Investments

In burning out our investments over the gas plate we have employed for more than a year, a home-made screen and there is no indication that the flame has had any deleterious effect upon the wire out of which it is made. Secure a sufficient number of feet of nichrome wire for your purpose and weave it into a net-work large enough for the support upon which it is intended to rest.—*Dayton D. Campbell.*

To Etch the Surface of a Gold Inlay

Dr. C. J. Hadley called our attention to the value of mercury for etching gold. This may be accomplished more easily if we will moisten the exposed surface—or the surface not protected with wax—with seventy-five per cent. hydrochloric acid and then treat it with mercury. After the surface has the desired etching, heat the inlay in an open flame to evaporate the mercury, plunge in the usual solutions and dry it. This gives us a fine crystalline surface for the cement to adhere to.

—*F. W. F., Pacific Dental Gazette.*

SOCIETY·ANNOUNCEMENTS

Vermont State Board

The next meeting of the Vermont Board of Dental Examiners for the examination of candidates to practice in Vermont, will be held at the State House, Montpelier, June 28, 29, 30.

Candidates will present for registration and preliminaries at ten A. M., Monday the 28th.

To be eligible for examination a candidate must be (1), twenty-one years of age; (2), a graduate of a high school of the first class; (3), a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 21st.

For further information and application blank, address,

HARRY F. HAMILTON, *Sec'y*,
Newport, Vermont.

Wisconsin State Board

The next examination of the Wisconsin State Board of Dental Examiners will be held in Milwaukee beginning June 21, 1920.

All applications and credentials must be in the hands of the secretary at least ten days before the examination.

Full information and application blanks may be received by addressing,

WILLIAM KETTLER, *Secy.*,
801 3rd St., Milwaukee, Wis.

Idaho State

The next meeting of the Idaho State Dental Association will be held in Pocatello, June 28th to July 3rd.

The services of Drs. F. Ewing Roach and Arthur E. Smith, of Chicago have been secured for the post-graduate classes.

M. J. GOODE, *Secretary*,
Filer, Idaho.

Northern Ohio

The Northern Ohio Dental Association will meet at Hotel Statler, Cleveland, June 7, 8 and 9. Also post-graduate course same week.

Yours truly,
GEO. B. SMITH, *Secretary*.

Pennsylvania State Board

The next meeting of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh, on Wednesday, Thursday, Friday and Saturday, June 23, 24, 25 and 26. The theoretical examinations will be held at Musical Fund Hall, 808 Locust Street, Philadelphia, and at the College of Pharmacy, Bride and Bluff Streets, Pittsburgh. These examinations will begin on Wednesday, June 23rd, at 9:00 A. M., and will continue Thursday and Friday. The examination in practical work will be held on Saturday, June 26th, at 8:30 o'clock, and will be held at the Evan's Dental Institute, 40th and Spruce Streets, Philadelphia, and at the University of Pittsburgh, Pittsburgh. Application papers may be secured from the Department of Public Instruction, Harrisburg. For further information apply to Dr. A. H. Reynolds, secretary, 4630 Chester Avenue, Philadelphia.

Yours very truly,
ALEXANDER H. REYNOLDS,
Secretary to the Board of Examiners.

Florida State Dental Society

The next annual meeting of this society will be held in Miama, Fla., June 15, 16 and 17.

H. B. PATTISHALL, *Secy.-Treas.*, Jacksonville.

Tennessee State Dental Association

The Fifty-third Annual Meeting of the Tennessee State Dental Association will be held in Chattanooga, May 27, 28, 29, 1920.

The special attraction this year will be Dr. George Winter, St. Louis, Mo., subject: Exodontia. Dr. E. R. Hard, St. Louis., Bridgework and Porcelain. Dr. Chalmers J. Lyons, Ann Arbor, Mich., Focal Infection.

All ethical dentists are cordially invited to attend the meeting.

O. J. O'NEAL, *Chairman, Pub. Com.*, Chattanooga.

South Carolina State Board of Dental Examiners

The next meeting of the South Carolina State Board of Denta Examiners will be held at the Jefferson Hotel, Columbia, S. C., beginning at 9:00 o'clock, Friday morning, June 11.

Further information and application blanks may be obtained by addressing Dr. R. L. Spencer, Secretary, Bennettsville, S. C.

Section in Stomatology, American Medical Association

The annual meeting will be held in New Orleans, La., April 28, 29, 30, 1920. A splendid program has been arranged and timely subjects will be discussed by men prominent in the dental profession.

North Dakota State

The North Dakota State Dental Association meets in Grand Forks, May 11, 12, 1920. A live program has been arranged for. This will be followed by the North Dakota Post Graduate School who have obtained the services of Dr. Milus M. House, on Artificial Dentures, and Dr. Arthur E. Smith, on Conductive Anesthesia and Nerve Blocking.

LALON CAUM, *Secy.*,North Dakota State Dental Assn.

Psi Omega Fraternity

The Reunion and convention of the National Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, July 12, 13 and 14, 1920.

Indiana State Board

The next Indiana State Dental Examination will be held in Indianapolis, June 14th to 20th inclusive.

Applicants will be accepted from class A and B colleges.

Preliminary educational certificates must be examined by State Superintendent of Public Instruction two weeks in advance of the examination.

For further instructions and application blanks, address H. C. McKittrick, D.D.S., 1006 I.O.O.F. Bldg., Indianapolis, Ind.

Pennsylvania State Dental Society

The Fifty-second Annual Meeting of the Pennsylvania State Dental Society will be held in the Rajah Theater, Reading, Pa., April 27, 28 and 29, 1920. An interesting and instructive program has been prepared. All ethical practitioners are invited to be present.

W. L. FICKES, *Secretary*,
6004 Penn. Ave., Pittsburgh, Pa.

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Two Illustrated Lectures, by Dr. Norman B. Nesbett, of Boston, Mass.
Harvard University, Dental Dept.
ON REMOVABLE BRIDGE WORK

Dr. Thomas B. Hartzell, of Minneapolis, will give two Illustrated Lectures, one on "Pyorrhea and its Treatment," and one on "The relation of Dental Diseases to the Public Health."

Doctor John Paul Jones, of the Mayo Clinic, will give an Illustrated Lecture on "The Position of Dentistry in Group Medicine." Covering the question of Focal Infections and their relation to disease, the importance of the X-Ray in determining this, the necessity for full-mouth Radiograms and when to take a radical stand for the extraction of teeth, etc., with slides showing many practical cases presented for treatment at the Mayo clinic.

Indiana will be represented by the following:

Drs. Wm. C. Hessler, of Crawfordsville, Robt. Gillis, of Hammond, and Carl D. Lucas, of Indianapolis.

There will be an all-day clinic by Dr. Norman B. Nesbett besides an unusually large number of other Clinics.

The Exhibits will be in the famous Riley room at the Claypool Hotel, and as all the floor space has been taken there will be a large number of Exhibitors.

Altogether this will be one of the very best meetings the Indiana State Dental Association has ever held.

Make Your Hotel Reservations Early!

OHIO STATE SOCIETY

Notice to Members: Copies of the revised Constitution and By-Laws of the Ohio State Dental Society have been sent the Secretary of each Component Society in number sufficient to supply each member with a copy. Ask your secretary for one.

F. R. Chapman, *Secretary.*

OFFICERS

President, C. W. MILLS, Chillicothe   President-Elect, H. M. SEMANS, Columbus
Vice President, C. H. SCHOTT, Cincinnati
Secretary, F. R. CHAPMAN, 305 Schultz Bldg., Columbus
Treasurer, A. O. ROSS, Columbus

Committees for 1920

Ad Interim Committee of the Board

C. W. Mills   H. M. Semans   C. H. Schott
F. R. Chapman   A. O. Ross   Harry Cope
E. C. Mills   L. P. Bethel   F. M. Casto

Publication

F. R. Chapman, *Chairman*
305 Schultz Bldg., Columbus
L. P. Bethel, Editor   W. G. Hamm

Program

L. P. Bethel, *Chairman*,
185 E. State St., Columbus
W. H. Whitslar   H. E. Germann

Clinic

F. M. Casto, *Chairman*
458 Rose Bldg., Cleveland
L. E. Custer   T. I. Way   D. P. Snyder

Board of Censors

J. F. Stephan, *Chairman*
1402 Guardian Bldg., Cleveland
G. H. Williamson   E. E. Hall

Committee on Arrangements

Harry Cope, *Chairman*
328 E. State St., Columbus
J. R. Kelly   C. W. Strosnider

Hygiene

E. L. Pettibone, *Chairman*
6503 Detroit Ave., Cleveland
E. W. Martindale   C. E. Smith
E. S. Braithwaite   H. M. Brewer

Dental Legislation

H. C. Brown, *Chairman*
609 Hartman Bldg., Columbus
L. L. Barber   W. H. Hayden

Committee on Components

H. M. Semans, *Chairman*
College of Dentistry, O. S. U., Columbus
And the President of each Component Society

Membership

C. H. Schott, *Chairman*
511 Neave Bldg., Cincinnati
And the Treasurer of each Component Society

History

C. I. Keely, *Chairman*
Hamilton, Ohio
G. D. Edgar   F. M. Pursell

Library

E. C. Mills, *Chairman*
151 E. Broad St., Columbus
H. T. Smith   C. H. Martin

The Component Societies of the Ohio State Dental Society

(This list of Officers is compiled from information furnished by the Secretaries of the various Components; where incorrect it is due to lack of information relative to elections. Secretaries are requested to keep the list correct by notifying the secretary of the State Society or the Editor of The Dental Summary of the result of elections.)

22 Butler County Dental Society, meets 3d Friday. each month.—Pres., P. A. Krucker, Hamilton, V. Pres., E. E. Meisterhaus; Sec.-Treas.. F. T. Craven, Hamilton.

10 Central Ohio Dental Society, meets 1st Wed., Feb., May and Oct.—Pres., F. P. Leonard, Bucyrus; V. Prests., J. Pfanstiel and R. C. Bratten; Rec. Sec., L. T. McKinney; Cor. Sec., C. S. Delashmutt, Bucyrus; Treas., F. C. McCaughy.

27 Cincinnati Dental Society, meets 3d Friday. Pres., Wilson Foster, 22 W. 7th St.; V. Pres., Paul Cassidy; Rec. Sec., C. H. Stricker; Cor. Sec.. D. A. Leahy, 904 Union Central Bldg.; Treas., J. D. Gordon

6 Cleveland Dental Society, meets 1st Monday, Pres., I. M. Saum; V. Pres., J. A. Loughry; Rec. Sec., S. F. M. Hirsch; Cor. Sec., F. M. Casto, 458 Rose Bldg.; Treas., E. D. Phillips.

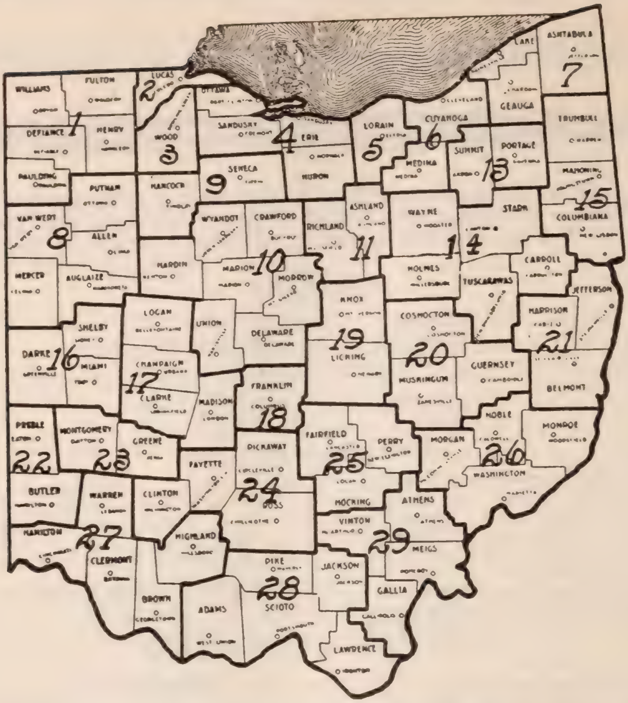
1 Columbus Dental Society, meets last Tuesday, Pres., D. P. Snyder; V. Pres., F. L. Gruber; Rec. Sec.. E. N. Hoopman; Cor. Sec., F. C. Starr; Treas., A. O. Ross.

15 Corydon Palmer Dental Society, meets 2d Thursday, April and Oct.—Pres., J. F. Steele, Lisbon; V. Presidents, T. J. Evans, J. H. Chessrown and G. L. Moore; Rec. Sec., J. T. Williamson; Cor. Sec., W. B. Challis, Lisbon; Treas., J. K. Nash.

21 Eastern Ohio Dental Society, meets 1st Thursday, May and October—Pres., C. S. Starkweather, Bellaire; First V. Pres, L. B. Peterson, Steubenville; Second V. Pres., George Sharp, Flushing; Cor. Sec., J. K. Hunter, Bridgeport; Rec. Sec., H. A. Smith, Steubenville; Treas., S. C. Hasbronck, Barnesville.

9 Hancock - Seneca Counties Dental Society, meets 2d Wednesday.—Pres., A. C. Cole, Fostoria, V. Pres., ———; Rec. Sec., E. V. Burns, Findlay; Cor. Sec., A. E. Mann, Findlay; Treas., V. H, Michener.

25 Hocking Valley Dental Society, meets 1st Monday.—Pres., J. J. Stukey; Vice Pres'ts., C.F.Acker; and W. M. Scott; Sec., R. H. Wetzel, Lancaster, Treas., J. A. Rockey.



5 **Lorain County Dental Society**, meets 1st Tuesday, Feb., Apr., Sep. and Nov. Pres., F. A. Newhall, Lorain; V. Pres., C. J. Love; Sec., J. G. Wherry, Elyria; Treas., J. E. Trombley.

17 **Mad River Valley Dental Society**, meets 2d Monday, bi-monthly.—Pres., E. Dibert, Springfield; Vice Presidents., A. E. Bible and H. Houser; Rec. Sec., H. H. Krapp; Cor. Sec. W. B. Seward; Treas., E. V. M. Thompson.

1 **Maumee Valley Dental Society**, meets 2d Tuesday, June and Oct.—Pres., N. A. Cunningham, Defiance; V. Pres., A. S. Blake; Rec. Sec., S. D. Potter; Cor. Sec., O. J. Wisman, Delta; Treas., J. A. Benner.

23 **Miami Valley Dental Society**, meets last Monday. Pres., H. C. Huffman; V. Pres., H. L. Oliver; Cor. Sec., H. M. Brewer; Rec. Sec., W. B. MacBain; Treas., J. R. Arthur; J. M. Chase; representative to the State Dental Society.

20 **Muskingum - Coshocton - Guernsey Counties Dental Society**, meets 2d Thursday, Jan., May and Sept.—Pres., P. F. Walker, Coshocton; V. Prests., A. W. Boyd and T. E. Axline; Sec., J. A. Honabarger, Warsaw; Treas., H. J. Boyd.

4 **North Central Ohio Dental Society**, meets 3d Wednesday, Jan. Apr., July and Oct.—Pres., A. G. Thatcher, Fremont; Pres. Elect., E. S. Braithwaite, Willard; Vice-Pres., H. S. Rogers, Sandusky; Rec. Sec., D. D. Smith; Cor. Sec. J. H. Billmeyer, Norwalk; Treas., L. F. Meyer.

7 **Northeastern Ohio Dental Society**, meets 2d Monday—Pres., H. O. Frederick, Ashtabula; V. Pres., O. T. Battles; Sec., R. J. Goggin, Ashtabula Harbor; Treas., R. J. Goggin.

8 **Northwestern Dental Society**, meets 4th Wednesday.—Pres., A. Jones, Lima; Vice Pres'ts., J. R Cannon and I. W. Wright; Sec. J. W. Dimond Lima; Treas., J. K. Bannister.

29 **Ohio Valley Dental Society**, meets 2d Wednesday, Apr and Oct—Pres. M. D. Hartinger, Pomeroy; V. Pres., R. B. Church; Sec., C. S. Shumaker, Pomeroy; Treas., J. B. Hodge, Middleport.

24 **Rehwinkel Dental Society**, meets 3d Thursday. Pres., A. M, Bush; V. Pres., O. A. Thompson; V. Pres., C. H. Martin; Sec,, F. D. Wollard, Washington, C.H.; Treas., C. V. Laam.

11 **Richland-Ashland Counties Dental Society**, Meets last Monday. Feb., June and Oct.—Pres., B. W. Livingston, Ashland; V. Pres., J. H. West-Rec. Sec., I. R. Suter; Cor. Sec., J. F. Clark, Mansfield; Treas., E. F. Cleland.

26 **Southeastern Ohio Dental Society**, no report

28 **Southern Ohio Dental Society**, meets, 3d Monday. May and Oct.—Pres., W. H. Johnson, Waverly. V. Pres., A. S. Adams; Sec., C. E. Beatty, Portsmouth; Treas., E. O. Buchanan.

12 **Stark County Dental Society**, meets 3d Wednesday—Pres., C. O. Carr, Massillon; V. Pres'ts., B. H. Bowman and J. G. Foltz; Rec. Sec., C. A. Allensworth; Cor. Sec., F. M. Lose, Massillon; Treas., F. M. Lose.

13 **Summit County Dental Society**, meets 1st Friday. Pres., J. T. Connors, Akron; V. Pres.,———; Rec. Sec., H. G. Haas; Cor. Sec., F. S. Butler, 2d Nat. Bank Bldg., Akron; Treas., A. S. Butler.

2 **Toledo Dental Society**, meets 3d Friday. Pres., T. S. Shaw; V. Pres., H. W. Hisey; Sec., L. C. Jackson, 2205 Ashland Ave.. Treas., C. H. Cox.

30 **Tuscarawas County Dental Society** (a new society) meets 2d Tuesday. Pres. A. W. Davis, Dover; V. Pres., F. H. Waldron; Sec. and Treas., E. S. Wagner, Dover.

16 **Western Ohio Dental Society**, meets 1st Thursday, Feb., May and Oct.—Pres., A. A. Davis, Troy V. Prests,, P. G. Eddy, J. J. Little and V. E. Bedford; Sec'y-Treas., F. A. McCullough, Troy.

3 **Wood County Dental Society**, meets 2d Wednesday.—Pres., B. D. Roe. Bowling Green; V. Pres., R. E. Milbourn; Sec., T. M. Lea, Bowling Green; Treas., E. R. Beatty.

19 **W. D. Miller Dental Society**, meets 2d Thursday. May and Oct.—Pres., W. S. Deely. Mt. Vernon; V. Pres,, H. S. Barrick; Rec. Sec., L. E. Davis; Cor. Sec., E. V. Prior, Newark; Treas., W. B. Grossman.

REPORT OF DEPARTMENT OF ORAL HYGIENE, STATE BOARD OF HEALTH OF TENNESSEE

BY DR. A. G. BUCKNER, OF BUREAU OF ORAL HYGIENE

An oral hygienist in every county of the state to make regular inspections of the teeth of school children and to lecture on the need and importance of the care of the teeth is a portion of the program of the newly-formed state bureau of oral hygiene. Already county oral hygienists have volunteered to serve in more than forty counties, and thousands of school children of Tennessee already have received instructions and examinations by these practitioners.

Previous to the appointment of the county mouth specialists a survey was made by one of the units of the bureau of rural sanitation in the schools of eight counties of West Tennessee. The purpose of the survey was to ascertain the condition in the mouth of a public school student. Hundreds of examinations were made and the results totaled showed that more than eighty-five per cent. of the scholars needed expert dental treatment.

Because of the fact that many diseases enter the body through either the mouth or the nose, the importance of having a healthy mouth cannot be too strongly emphasized. The care of the teeth is one of the most important factors in keeping up the public vitality, and as disease germs cannot multiply in a mouth in normal healthy condition, our educational campaign during the coming year is extremely important.

While it is not a generally-known fact, still the mouth always is filled with disease germs. An easy way to prove this fact is to moisten a slice of potato with the tongue and then place it in a saucer under an inverted glass with a few drops of water around the base of the potato to keep it moist. Within seventy-two hours little blotches of white will appear on the potato, and if these blotches are placed under a microscope they will turn out to be cultures of various kinds of germs.

A mouth in an unhealthy condition is a perfect incubator for diseases of all description, and for this reason the bureau of oral hygiene is planning an extensive program of education among the school children of the state during the coming year. In preliminary reports of the various county hygienists I have found that in addition to speaking in all of the schools the members of my staff also have spoken to Sunday schools.

We have been able to enlist the support of the entire dental profession and also have obtained the co-operation of the Tennessee Anti-Tuberculosis Association, which last year organized eighty thousand school children of Tennessee in a modern health crusade. To obtain membership in this organization the children must daily perform certain health chores which are noted on score cards by the mothers, who turn them in to the teachers. One of the most strongly emphasized of the health chores is the daily care of the teeth.

The day is coming when the state will not only feel that it must give its children an education, but that it also should graduate them from our public schools with clean bodies as well as clean minds. The time is coming too, when we shall have not only mouth specialists making regular examinations to correct oral faults, but also specialists from every other branch of the medical profession making regular examinations of our school children to correct faults which hinder them in their studies.

In the meantime this work must be accomplished in part by pioneer health organizations such as the Tennessee Anti-Tuberculosis Association. This society already has accomplished wonderful work in teaching our school children to form healthful habits which foster personal cleanliness. Next year it will organize another modern health crusade and the health workers of the association will co-operate with the county oral hygienists in this "Better Teeth, Better Health" movement. We expect it to be an even more potent force in community health improvement during the coming year.

Tennessee State

The next meeting of the Tennessee State Dental Association will be held at Chattanooga, Tenn., May 27-28-29, 1920. A splendid program has been prepared and this promises to be a rousing meeting. Dr. Chalmers J. Lyons, of Michigan State University, Drs. Hart and Winters of St. Louis, and other men of national reputation will be with us. Early hotel reservations are advised.

C. E. BYINGTON, *Secretary*

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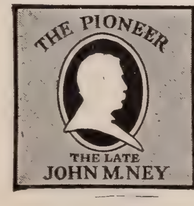

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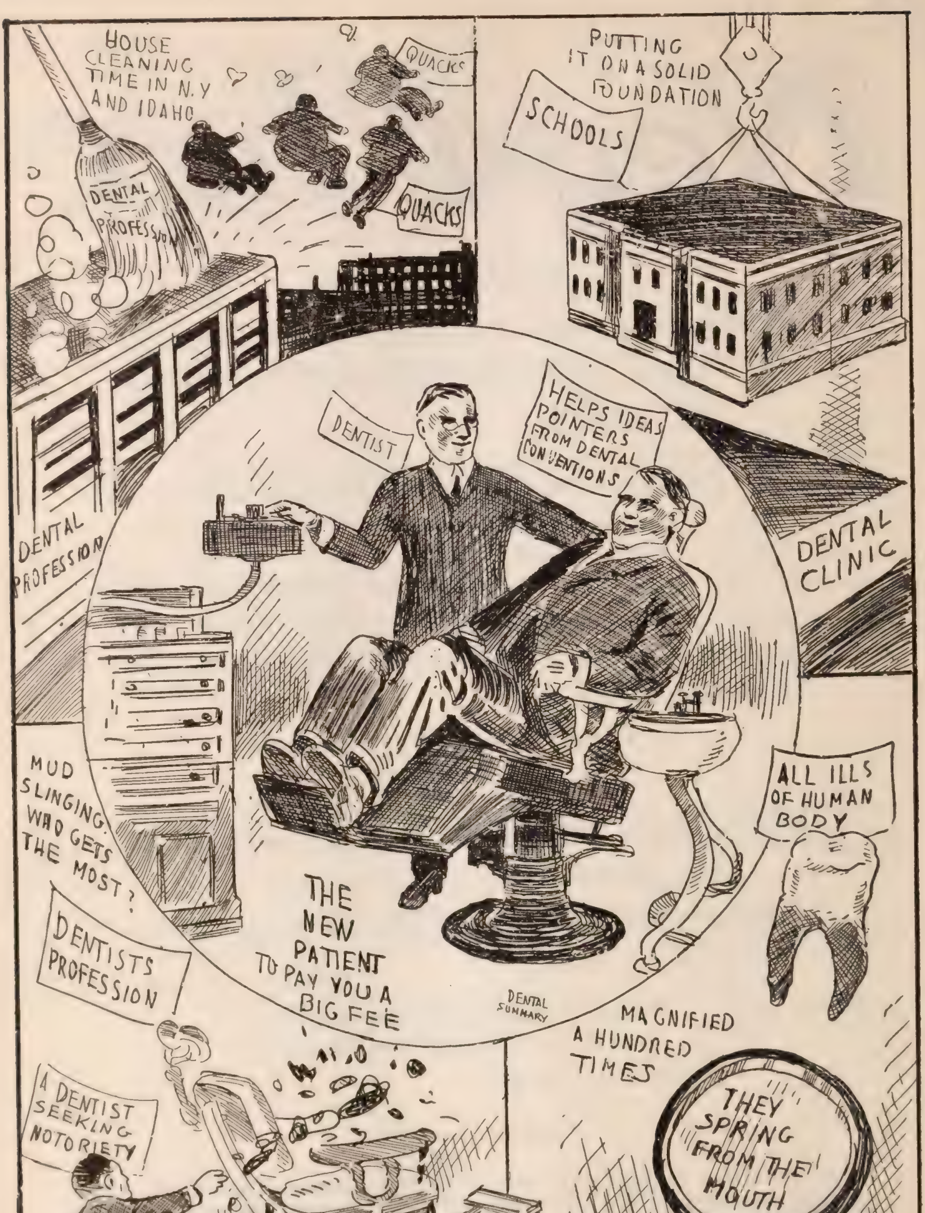
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Dental News in Crayon.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

Why Should Germany be "Restored"?

There was once a farmer who, early one fine spring morning, found a snake in his field, stiff with cold and nearly dead of hunger. And he gathered that snake up with some care, handling it gently, and put it on the kitchen hearth, where the warmth of the stones soon restored it, when it immediately reared itself up and bit the wife and child of that farmer until they died. And what did that farmer expect? Had he not learned that a snake is a snake? Was the snake in any way to blame? Why, it simply carried out the law of its being. Moral: A Hun's a Hun, cold or warm. If he is to be "restored," he should restore himself, in his own way, with whatever of material and energy he may have.

We have been reading and hearing a great deal lately about the necessity of restoring Germany to the financial and commercial condition she occupied before she chose to throw it all away in a mad effort to conquer and dominate the world. And, of course, this means to hand back to her certain territories and other "necessities" taken away from her by the Allies by the peace treaty. In other words, to place Prussia again in the saddle, and enable Germany to repeat, in a few years, her Crime of 1914.

Nobody can understand the present nor predict the future except in the light of history. Let us see what history has to say about Germany's acquisition of these territories and things, as told by Frank H. Simonds, in one of the best articles on the war he ever has written:

In America more than anywhere else the plea to restore Germany finds ready hearing, because Americans are little familiar with the circumstances of the making of Germany. The story of the fashion in which for a century and a half the Polish race has suffered every sort of wrong because for Frederick the Great's scheme of creating a strong Prussia the destruction of Poland was a necessary detail, is little appreciated because generally unknown.

Criticise the economic features of the Treaty as one may, the territorial features entitle it to recognition as the fairest of the great settlements which have been made in all European history. From Germany it took Alsace-Lorraine, Posen, West Prussia, Danzig and conditionally Upper Silesia and the Sarre. But each of these circumstances represented successful plundering in past times and if such was a foundation stone of contemporary Germany's economic existence, it was no less legally and morally the possession of another nation.

Germany restored is the German peril renewed, because the peril had its origin in perfectly familiar circumstances, which have for centuries operated in exactly the same way. To destroy Germany is impossible, but it is for Germany to rebuild and if the world is to have surcease from the German menace the new German structure will have to be in accordance with German circumstances, not resting upon the insecure bases of stolen territories and intelligent exploitation of what belongs of right to other nations.

To begin at the beginning, in 1742 Frederick the Great, by one of the foulest offenses against right and justice and in repudiation of his own written pledge, attacked Austria and seized Silesia. One portion of Silesia was inhabited by Poles, exactly the district which the treaty of Versailles assigns now to Poland.

Thirty years later the same sovereign engineered the first partition of Poland, and Frederick's successors continued the work, acquiring substantially the areas which, under the treaty are returned to the Poles.

In 1814, Prussia took the Sarre coal basin.

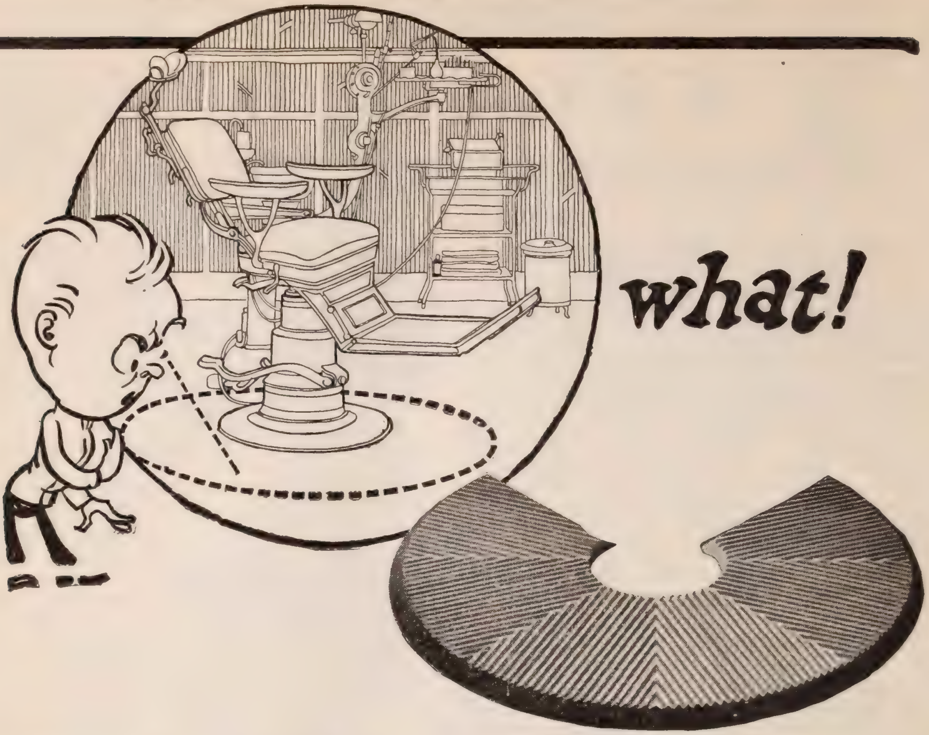
In 1871, after the Franco-Prussian war. Germany annexed Alsace-Lorraine, thus completing the acquisition of the coal districts and at the same time acquiring the vast iron regions north of Metz.

Finally, in 1864, Prussia led Austria into an attack upon Denmark which resulted in the seizure of Schleswig-Holstein and in 1866, Prussia attacked Austria, and after successful war annexed Schleswig-Holstein, promising to permit the Danes in Schleswig to decide their nationality by vote, but never making good the promise.

Now the acquisition of Germany in these wars of conquest are precisely the foundations of the economic development of Germany. They have served to supply Germany with the opportunity to transform herself into a great industrial nation. In 1870 her population was no greater than France; in 1914 it was almost twice as great.

The whole expansion was explicable in terms of stolen property. If France still possessed the Sarre and Alsace-Lorraine, if Poland still kept only the regions in which Poles predominated, then Germany would be deprived of precisely those raw materials, the iron and coal, which were in large measure responsible for her great expansion.

Literally, Germany became an overcrowded nation, living on its manufactures, dependent upon foreign markets, but without power to protect its commerce and ever needing more territorial increases to meet the growing demands of its population, which continued to increase by leaps and bounds. But only because Germany, and Prussia before Germany, had successfully despoiled France and Poland, Austria and Denmark of valuable provinces was she able to engineer this vast economic



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Circomats put an end to foot pains and nerve strains—no more fag after a busy day.

Nearly all good dental supply houses in the United States sell the Circomat. If your dealer does not, send us his name and we will arrange to supply you.

United States Rubber Company, 1790 Broadway, New York City.

	½ Circle	¾ Circle	Circle
Black	$15.00	$20.00	$25.00
Mahogany	20.50	29.00	37.00
White	21.00	30.00	39.00
Green	22.00	32.00	41.00
Gray	23.00	33.00	43.00

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development. It was founded upon successful robberies of states, which, had they possessed the resources taken from them, might have developed similarly within their own frontiers.

Now the treaty of Versailles has faced the facts of the situation. It has by no means done full justice. It has not restored to Poland all of the regions stolen by the Germans.

The question occurs on the degree to which the world feels it wise or necessary to give the Germans a new opportunity to repeat recent history.

Granted that the restoration of Germany on the economic side would solve many contemporary economic problems, what would be the political effect? In any event the Germans will find themselves with the same dense population, capable of maintaining itself only by foreign commerce.

If Germany did not, could not accept the limitations of 1914 how can Germans accept those of 1919? If German economic life is brought back to the old situation of prosperity, how can one escape the conviction that German political life will take the old directions? *It is nonsense and worse than nonsense to believe that German policy was dictated by insane militarism, which sacrificed the economic life of the country to delusions of political grandeur.* The truth is that the German economic expansion *developed the militaristic view.* The army has for a century and a half been merely the pioneer preparing the way for Prussian commercial development.

It is not difficult to perceive that if Germany be restored, she will become in due time the economic master of middle Europe, and this spells the realization for the German of the old dream of Mitteleuropa. Master of the Middle of Europe, will he not inevitably return to his old demands for the possession of Belgian and Dutch ports, for the control of the north of France, not for military reasons, primarily, but for the far more compelling reasons of international trade and industrial independence?

We are asked to do this without any full appreciation of the fact that the character of this economic expansion was such that it led to German attacks upon neighboring states and compelled the Germans to conquer or to migrate. Thus we are asked to contribute to restoring what were the conditions out of which the war inevitably resulted. And those who ask it close their eyes and would close ours to everything except the merely superficial circumstances, self interest, contemporary terror of disorder, the desire to get the war over and forgotten.

It was the German economic system, founded upon forcible annexations, which led to the present world war; to reproduce all of the old conditions in Germany would merely be to reproduce all the old "necessities." German policies were not accidents of Kaiser or of militarism; they had roots in commercial and economic conditions.

It is for France and for Poland to decide whether the rehabilitation of Germany at their expense is a profitable enterprise for them; it is not for Great Britain or for the United States to insist upon such a rehabilitation.

Dentist Wanted

If any SUMMARY reader knows of a dentist who is dissatisfied with the progress he is making in building up a practice and would like to associate himself with a leading dental manufacturing concern in a strictly professional, clinical and advisory capacity, he may be doing him a good turn by telling him to write to THE SUMMARY, or to me. One between twenty-eight and forty preferred. *Must* be a thoroughly good, all-around dentist able to think clearly and speak from his own knowledge.

There may be many such who find the operative or some other branch distasteful, who could make good in the work in mind. Should give full particulars in first letter.

—*G. E. H.*

Mr. SUMMARY Reader: Have you noticed your magazine lately? Isn't it a "hum-dinger?" Wouldn't you like to extend your own subscription three months without it costing you one cent? Here is the way to do it: Send us just one new subscriber from your town. Mention this item when you send it in. That's all. Your subscription will be moved ahead three months. Will cost you five minutes' work.

Here's the latest: Man in New York thought he might pick up a little spare change on the side. So he made up a "sucker-list" from dental and medical directories, and proceeded to work his little scheme. Had some beautifully engraved letter-heads printed on the best of paper. On these letter-heads he wrote individual letters, signed with a pen, and sent them to a "selected" list of some ten thousand dentists and physicians, explaining how he had conceived the idea of rebuilding worn-out automobiles, supplying new parts when necessary, and in every way making the machines equal to new—sometimes better; and that he had conceived another unique idea in advertising. Instead of spending large sums for costly printing and magazine space, he would give these amounts to the first dentist and physician in any community who ordered one of his rebuilt machines in the form of a wonderful discount. While his autos were equal or superior to new, and ordinarily should sell at only a small reduction, he would enter the order of the first man in each of the two professions who would send him the small sum of one hundred dollars, with the understanding that the fortunate purchaser was to tell all of his friends of the wonderful bargains they could secure by "writing at once."

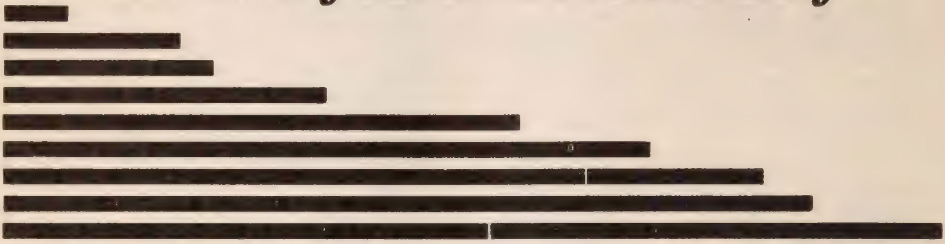
Hundreds bit. Nobody ever will know how many thousands of dollars "spare change" this man picked out of the pockets of his dupes before postal authorities got him. After his arrest and the issuance of the fraud order against the delivery of mail to him, the money continued to roll in, more than a hundred thousand dollars, it is said, being returned to the senders.

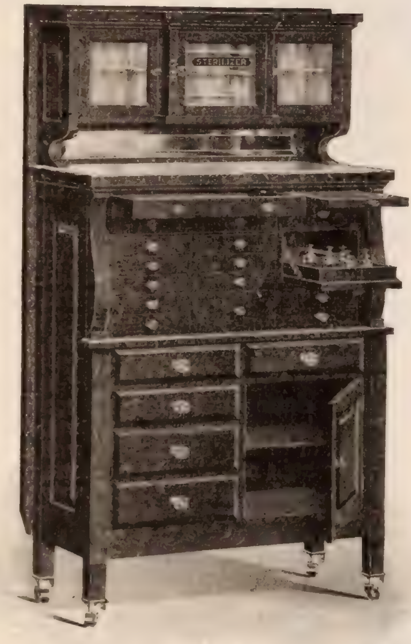
Of course, the receipt of the money ended the transaction; that's all there was to it. There were no automobiles in the case from first to last.

Wonder why he selected dentists and doctors!

"60" SALES GROW

for nine years—continuously





No. 60E, Open

FOR NINE YEARS sales have steadily increased on the "60" series of dental cabinets.

The cabinet illustrated is one of the best numbers in the "American" line—the addition of the "E" top with formaldehyde sterilizer multiplying its utility and beauty.

To thoroughly appreciate the service this cabinet will give—and it may prove exactly what your office requires—write for catalog and prices.

The American Cabinet Company

Two Rivers, Wisconsin

Here's another case: A glib salesman came to see me the other day, offering to sell me some stock in a new movie concern, offering one share of common stock as a premium with the purchase of every share of preferred. I didn't buy; wasn't interested; wouldn't have bought if money were as plentiful with me as leaves in the gutters in the fall. Sometime later, another chap called and amended the offer to TWO shares of common to one of preferred. Then I knew I didn't want the stock. Too much for too little. May be all right at that; probably is. But, in investing money as in playing poker—"In case of doubt do nothing," is a mighty good rule to follow. And another one is: Good things don't come in prize packages. If you had a good thing you wouldn't offer to pay somebody to take it away from you, would you? But if you had something of which you were a little doubtful, you might be glad to have somebody share your chance of loss—eh? It's a pretty good rule to let the other fellow hold the bag.

The correct name of the dental scrapper known as Leach Cross is Louis C. Wallach. He is of Jewish birth, and was 34 years old on March 13.

There are about twelve hundred "mechanical dentists," i. e., laboratory men who are not dentists at all but mechanical artisans, in the city of New York. Pay ranges between twenty and seventy-five dollars per week.

There is no longer the slightest shadow of excuse for the failure of dentists to make correct diagnosis of every case presented before attempting any operation, nor of performing the necessary operation in anything but the most careful manner as to asepsis, at least. Teeth are not shoe-pegs, but integral parts of the human economy, every atom of which stands in the most intimate relation to every other atom. If every act of every member of the human family produces an effect upon every other member, how much more certainly every action committed upon every unit in the body produces a precisely proportionate effect upon every other unit. No, sir; I do not want to be a dentist; the responsibility is too great.

A loss to the government of around twenty thousand dollars was incurred through the burning of dental equipment at Camp Grant, Ills., caused by the explosion of a vulcanizer. No one seriously injured, although there were a number of narrow escapes.

The lay press is still talking about "dental tools." Quite in line with reference to brother dentists as "good workmen." If you want to be considered as professional men better get professional habits of speech.

Two requisites to successful practice: A dentist must be noticeably clean, and noticeably well dressed. The cleanest men in the U. S. today are barbers. Noticed an inch of soiled collar above the coat worn by a dentist the other day. Called his attention to it. He said the coat-collar had soiled it. Told him to have the coat cleaned and keep it that way. Said he would.

Rochester Dental Dispensary has raised the income limit to a maximum of thirty-five dollars per week for a family of four or more. This opens the door for greatly increased beneficence. The old limit was five dollars per week per capita.

A movement has started in the New Jersey senate to make dentists exempt from jury duty. Why not start something in other states?

The head of Rockefeller Foundation asserts that country children are not so well nourished as those in cities, and suffer more from malnutrition.

Vanderbilt School of Dentistry, Nashville, has been given Class A rating by National Dental Educational Council in recognition of high standards and thorough work. Of the forty-eight dental colleges in America only eighteen bear highest rating. This action places the dental college of Vanderbilt on an equal footing with the medical college, recognized as the finest south of the Ohio. No more conscientious men live than those now in charge of the Vanderbilt dental school. Each man impresses one as being most intensely and intensively in earnest, taking his work with the full degree of seriousness that their high calling deserves.

Creighton University, Omaha, has appropriated three hundred and fifty thousand dollars for new buildings. Of this amount a goodly share is to be put into new home for the dental school.

South Bend, Ind., dentists are arranging for a child welfare week some time during April.

A school of mechanical dentistry has been opened at Greenville, S. C.

A society of dentists' assistants has been organized at Kansas City.

Terre Haute, Ind., dentists have agreed upon a minimum charge of two dollars for examination, whether the patient passes under his treatment or not. All other fees have been so greatly increased that the lay press expresses the fear that few will be able to pay for necessary service.

An American dentist has leaped into fame very suddenly over in London, by reason of an operation performed for Viscount Gray while in Washington, by reason of which his failing eyesight was completely restored and greatly improved beyond its normal condition when in health.

The principal reason why the present government of Mexico despises and hates America and Americans is that, under the rule of Diaz many unprincipled citizens of this country were called to the aid of that despotic president whose sole purpose and aim was the exploitation of his country for his own benefit, financially. The cabinet of Diaz was simply a cabal, having for its one purpose the more complete enslavement of the peon and the aggrandizement of the privileged classes. Just now the middle and lower classes down there are in the saddle, and nobody need expect much sympathy for those charged with helping to keep them down.

United States Public Health Service

DENTAL EXAMINERS APPOINTED BY THE BUREAU OF WAR RISK INSURANCE

Up to and including March 18, the following appointments had been reported:

McMinn county, Tennessee, Dr. James S. Vaughn, Athens; Darke county, Ohio, Dr. S. F. Ridings, Greenville; Benton county, Indiana, Dr. Walter T. Clark, Fowler; Rensselaer county, New York, Dr. J. J. Purcell, Troy; Vanderburg county, Indiana, Dr. LeRoy Fink, Evansville; Grant county, Indiana, Dr. H. F. Gravelle, Marion; LaSalle county, Illinois, Dr. Guy A. Karr, Ottawa; Rock Island county, Illinois, Dr. Sidney A. Wiggins, Rock Island; McDonough county, Illinois, Dr. C. P. Jackson, Macomb; Cattaraugus county, New York, Dr. J. J. McCarthy, Olean, and Dr. J. I. Kerns, Salamanca; Peoria county, Illinois, Dr. C. E. Chamberlain, Peoria; Monmouth county, New Jersey, Dr. John L. Remsen, Asbury Park; Lake county, Illinois, Dr. Charles B. Johnson, Waukegan; McLean county, Illinois, Dr. E. W. Chrisman, Bloomington; Rochester district, New York, Dr. Frank H. Hendrickson, Rochester; Second district, New York, Dr. John C. Tooke, Utica; New York state Supervising Examiner, Dr. Frank D. Pierce, New York City; Menominee county, Mich., Dr. R. Nowack, Menominee; Lorain county, Ohio, Dr. T. C. Gonder, Lorain.

Indiana—Western

Terre Haute, Ind, March 13—The annual convention of the Western Indiana Dental society met this morning at the Hotel Deming and elected officers for the coming year as follows: George Marbach, of Terre Haute, president; A. A. Spears, of Brazil, vice-president; Noble Fox, of Terre Haute, secretary; L. E. Trinkle, of Terre Haute, treasurer; W. G. Rice, of Terre Haute, state trustee. Society trustees elected were as follows: O. M. Brown, three years; George Russell, two years, and F. P. Anshutz, one year. All are Terre Haute dentists.

Indiana—Southern Organized

Aurora, Ind., Feb. 27—The dentists of Dillsboro, Lawrenceburg and Aurora held a meeting at the Aurora Library, Friday, Feb. 20th, at which time the Southern Indiana Dental Society was organized.

The officers elected were: H. J. Longcamp, president; G. M. Terrill, vice-president; and T. B. Campbell, secretary and treasurer.

The society will meet the first Monday of each month at which time papers will be read by the different members on subjects in keeping with the rapid strides being made in the profession.

Virginia-Tennessee—Joint Organization

Bristol, Va.-Tenn., Feb. 22.—Organization of the profession of dentistry of Sullivan county and Bristol was perfected at a meeting of the dentists held at the Chamber of Commerce grill last week. The new organization is to be called the Sullivan County and Bristol City Dental Association and is to operate throughout the county and city. Announcement made last night indicates that the society will not include this county and city alone, but expects to broaden out later.

Election of officers was held at the meeting last week and J. T. McIntyre was named president; G. K. Barkley, vice-president, and Charles M. Quillen was designated secretary and treasurer.

"The purpose of the organization is to better the profession of dentistry," stated Dr. Quillen last night, "and to educate the public to the value of good dentistry." The organization will hold regular monthly meetings and will observe a banquet feature at each meeting. The next meeting will be held at the Chamber of Commerce Grill on the night of Tuesday, March 9.

Local dentists as well as those over the surrounding section are deeply interested in the new organization and a great deal of enthusiasm was evinced at the meeting last week. It is expected that the association will reach big proportions and that it will become one of the leading organizations of this section.

Wisconsin—Northern

Superior, Wis.—At the meeting of the North Wisconsin Dental association F. S. Lawson was elected president for the coming year. L. R. Moodie was elected vice-president and A. E. Halverson, secretary-treasurer. Committees were named as follows:

Censors committee—L. R. Moodie, D. H. August and B. B. Giffin.

Program committee—A. G. Fee, J. L. Malone and P. A. Skowland.

Membership committee—William F. Gould, Graham Fee, and J. L. Malone.

G. N. Sundquist was appointed press representative.

Wisconsin—Fond du Lac

Fond du Lac.—The Fond du Lac Dental society held its annual business meeting last evening at the Erving Hotel. Officers were chosen for the coming year as follows: President, C. A. Mortell; vice-president, J. E. McCarthy; secretary and treasurer, E. F. King. W. E. Tennant was elected to serve on the board of censors for three years.

Dr. Homer C. Brown Busy Again

Columbus, Ohio, March 6—A campaign to get at least as many dentists for the army as there are veterinarians was launched in Washington by Dr. Homer C. Brown, of this city, chairman of the legislative committee of the dental association.

"Under the existing law," said Dr. Brown, "there is one dentist for every thousand soldiers, while there are three veterinarians. No dentist on earth can render a decent service for one thousand people."

Dr. Brown is anxious that if the proposed excise tax on gold is levied, it shall not be made to apply to gold used in dental work or eyeglasses and the like.

Aseptic Absorbent Points

(Johnson & Johnson)

Surgically Clean

For Drying Pulp Canals

The observance of the rules of true asepsis in pulp canal operations as now recognized and practiced by leading dentists of this country, necessitates the use of surgically clean absorbent materials for the drying of pulp canals. A marked departure from some of the old methods is imperative. Loose cotton (that was once aseptic) wrapped upon a broach under ordinary conditions, with the fingers will not do.

To attain any degree of certainty in the successful treatment of pulpless teeth, the general rules of aseptic surgery must be observed. Absorbent Points are surgically clean. They are to be handled with sterilized instruments only. The fine even taper and wire-like quality of these points admit them to canals inaccessible to any other form of absorbent.

Put up 200 in box, each box in four aseptic compartments.

Sold by leading Dealers in Dental Supplies in every country in the world.
Specify Johnson & Johnson's

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New Brunswick, N. J., U. S. A.

LISTERINE

offers a definite, dependable service to the Dental Surgeon in his operative work. The care exercised in the manufacture of Listerine insures a uniformity in preparation which may be relied upon to produce like results under like conditions.

LISTERINE

has an agreeable, refreshing taste, and this, combined with its well-proven antiseptic properties, makes it a most acceptable solution for use as a spray or wash prior to and after operations on the teeth or gums.

LISTERINE

possesses a two-fold antiseptic effect. After evaporation, a film, consisting of boric and benzoic acid, with baptisia tinctoria remains on the surface to which Listerine has been applied.

A small quantity of Listerine evaporated from a watch glass, or other suitable container, will disclose a residue of these beautiful crystals in abundance, as Listerine is a saturated solution of boric acid.

May we send a bottle of Listerine to your address, Doctor, for your observation and use?

Lambert Pharmacal Company

2101 Locust Street **St. Louis, Mo., U. S. A.**

Minnesota State

Minneapolis, March 7—With more than fifteen hundred delegates registered, the Minnesota State Dental Association convention, in session since Thursday, was concluded with the annual business meeting yesterday afternoon. Resolutions were passed and officers for the coming year elected.

During the convention, funds were collected by members of the women's auxiliary to the Minneapolis Dental Society for the establishment of the second free dental clinic in the city. A tag day was held, and a benefit motion picture show is to be given. Wives of visiting dentists were entertained by members of the auxiliary.

W. H. MacNeil, Minneapolis, was elected president of the state association for the coming year. Other officers elected were: F. L. Stepan, Mankota, vice-president; C. H. Turnquist, Minneapolis, secretary and T. D. Albernathy, Rochester, treasurer. F. E. Cobb and W. H. MacNeil, both of Minneapolis, were recommended to Governor Burnquist for the State Board of Dental Examiners. St. Paul was selected as next year's convention city.

A Thorough Survey

New York, Feb. 27.—Thorough professional examination of twenty-five thousand sets of teeth will be made by the advisory council on oral hygiene, appointed by the division of education hygiene of the Department of Education. The initial survey made at Washington Irving High School already shows results hitherto unknown to the profession and indicates the value of dental statistics.

The council of eleven dentists, made up of Waldo H. Mork, chairman; Thaddeus P. Hyatt, John F. Buckley, Paul Stillman, J. O. Taylor, W. W. Van Winkle, O. J. Long, Henry Bade, C. H. Peterson, Albert H. Stevenson and R. Clark, has obtained twenty pledges from other members of the Dental Society and its own membership to give the first and third Thursday of every month for a year to the work of examining the teeth of the high school children of the city.

Those already at work in these semi-monthly clinics include Drs. Holbrooke, W. Maller, F. Clayton, J. L. Peters, A. Lehan, Charles H. Feingold, A. Gabrielson, F. E. Buckley, A. Scheiner, W. J. Sutphin, Palmentier, Charles P. Turner, Seymour Adolph, A. Williams and W. Frazer. The time of these physicians is given without remuneration. The incidental expenses of the campaign are being borne by the Dental Society.

Individuality Urged

Cincinnati, Feb. 28.—Marcus L. Ward, one of the nation's leading dental surgeons and dean of the College of Dentistry of the University of Michigan, believes that the case of each patient should be considered separately.

"It is the tendency," he said, "of ninty per cent. of those engaged in dentistry to become proficient in one kind of treatment, some favoring fixed bridge work and some removable bridge work, and they apply their particular method to all cases regardless of whether it is the best in the treatment of the individual."

Dr. Ward addressed the Cincinnati Dental Society last night. He was the guest of the society yesterday, which gave a banquet in his honor at the Business Men's Club last night, followed by an address at the Literary Club.

Fred C. Hibbard, Chicago sculptor was also the guest of the society. He will draw plans for a memorial for the late Dr. John R. Callahan of Cincinnati, dental scientist. A fund of ten thousand dollars has already been raised by the State and National Associations for memorial at the General Hospital.

Big Demand for Hygienists

Dental hygienists are in great demand all over the country, according to Dr. Harvey J. Burkhart, director of the Rochester, N. Y. Dental Dispensary and School for Dental Hygienists.

"While at the National meeting I was besieged with requests from all over the country for dental hygienists and already have applications from prominent dentists and from school boards from different parts of the United States for the services of fifty graduates. The demand cannot be supplied at present, for all the present graduates have positions. However, this practically guarantees a position to every one of the girls who are now attending the school as soon as she has completed the course next June."

Dr. Burkhart recently received a letter from Walter Reed Army Hospital in Washington, D. C., stating that the dental hygienists have become part of the permanent organization in the Army Hospital as the remarkable record they have made has easily demonstrated their need. This letter refers to the twelve young woman graduates who were sent down to Washington from Rochester last year and who at present are employed there.

About fifty-five students, eighteen of whom are Rochester young women at present are enrolled in the school. Dr. Burkhart says it has been found necessary to decline any more pupils because the school hasn't facilities enough. He reports that many already have registered for next year's course which begins in September, 1920, and expects that the enrollment list will have to be closed long before the opening of the school for next term.

Dr. C. W. Brumfield, head of the Evansville, Ind., public school clinic, estimates that bad teeth cost that city $55,000 per year by preventing graduation.

Still that old question keeps bobbing up: "Where would we be without women?" Why not settle it once and for all by admitting frankly that we would be darn scarce?

The first American woman regularly entering the dental profession was Mrs. L. H. Taylor, who matriculated in a Cincinnati dental college in 1864.

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Are You Satisfied?

Opportunities for the field of mechanical dentistry are open nearly everywhere.

Mechanical dentistry is considered a mechanic art, or a professional trade, since it is part of the profession of dentistry or dental surgery. It offers a splendid field for the mechanically inclined young man who wishes to do fine, artistic work which is clean and well paid. It is better to start in at the bottom in a good laboratory than to take a short course of instruction in mechanical dentistry, as there is only one way to learn this trade and that is by actually doing the work. Every dentist has mechanical work to be done and is usually glad to have this work taken off his hands by a mechanical dentist.

A common school education is necessary, although high school training will help if the best positions are to be reached. The best school of training is on the job or a regular course in dental surgery as given by a high class university.

A young man who starts in a laboratory as a helper receives from ten to fifteen dollars a week to start. As he becomes proficient his salary will be increased to from thirty to fifty a week. The pay is equal if not better than other professional trades which require similar skill.

Bordering on professional work, this trade requires a high type of young man who will take pride in his product. He must be neat, painstaking and have a natural mechanical instinct. The work is almost entirely with the hands and requires fine workmanship.

The work consists of the making of casts and models; mounting casts on the articulator; the preparation and mixing of plaster; die and counter die construction; selecting, arranging and articulating of artificial teeth; making vulcanized rubber dentures; constructing artificial crowns of different types; designing and building up of removable and fixed bridge work; repairing of artificial dentures and casting porcelain.

In large laboratories men specialize in certain of the lines mentioned above and only perform that part of the work. This field is also open to women and offers them a good field. In certain of the finer work women do better work than men. There is nothing about the work that women cannot do and many are engaged in it at the present time.

If any reader is interested, I will be glad to have him write me concerning this work.

—*G. E. H.*

We still have a few copies of our re-print of the articles on Industrial Dentistry, published last autumn, which may be had free on application by any dentist who cares to do his part toward developing the clinic idea in the stores and factories in his locality. The articles were written by men already engaged in operating industrial clinics, and are thoroughly practical.

The Willys-Overland Co., Toledo, has installed a complete dental clinic.

DEATHS

At West Roxbury, Mass., January 21, Dr. Joseph King Knight, Jr., aged 32. He served in France during the war.

At Galveston, Texas, February 5, Dr. D. A. Burchfield, aged 38.

At Swissvale, Pittsburg, Pa., February 6, Dr. Clair DeWitt Walters, aged 26.

At Philadelphia, Pa., January 28, Dr. Hayes Agnew Clement, aged 55.

At Shamokin, Pa., January 29, Dr. Peter A. Callary, aged 32.

At New York City, January 30, Dr. William G. Law, formerly of Flint, Mich. Dr. Law was among the first to introduce American dentistry in Europe, and formerly enjoyed a large practice in Berlin.

At Perth Amboy, N. J., February 1, Dr. William D. Maxwell.

At Goshen, Ind., January 21, Dr. I. C. McCoy, of tuberculosis.

At Waco, Texas, January 20, Dr. F. G. Sory, aged 56.

At Oak Bluffs, Mass., March 4, Dr. Gardner M. Kingman, aged 86.

At Placerville, Cala., March 2, of pneumonia, Dr. C. M. Sumner, aged 46.

At Batavia, N. Y., March 3, Dr. Hiland H. Benjamin, aged 85.

At Rockwell, Md., February 23, Dr. Corbin Harris.

At Baltimore, Md., February 23, Dr. Samuel DeLeon Avery, aged 53.

At Rochester, N. Y., February 23, Dr. Henry S. Miller, aged 82. Dr. Miller was an inventor of many dental instruments, including the Miller contouring pliers; was first president Rochester Dental club, and a member of many dental and scientific organizations.

At Hartford, Conn., February 10, Dr. James McManus, aged 84. He was the oldest dentist in the state, both in years and length of practice; stood at the head of his profession in the state; began to practice at the age of twelve; a founder and first president Connecticut Dental Association; past president National Dental Association; he died full of success and honors.

At Birmingham, Ala., February 17, Dr. William Bert Goodwin, aged 37.

At Auburn, Me., February 19, Dr. B. S. Elliott, aged 37.

At Alexandria, Va., February 13, Dr. Charles T. Lindsey, aged 58.

At Brooklyn, N. Y., February 13, Dr. Charles C. Allen, aged 64.

Miss Annabelle Peterson, of Indianapolis, has been appointed supervisor of Red Cross nurses in the field in Indiana. She will assist Miss Ina M. Gaskill, assistant director of Red Cross Nursing Service for the state, in carrying out the Red Cross Nursing Department's peace time program. This includes the placement of authorized Red Cross nurses in public health service and the appointment of Red Cross nurse-instructors for classes in Home Hygiene and Care of the Sick and Dietetics.

Miss Peterson has just been discharged from Camp Taylor where she was in service more than a year. A graduate of Protestant Deaconess' Hospital Training School, in Indianapolis, she was one of the nurses who helped demonstrate the need for a visiting nurse association in her home city. This work was launched in 1912 and since has grown to be an indispensable part of the city's health activities.

Formerly Miss Peterson worked under the Marion County Graduate Nurses' Association. Miss Peterson has also done industrial nursing for the American Can Company of Indianapolis. She entered on her new work with the Red Cross, March 1, and will devote the greater part of her time to field supervision.

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DR. M. E. HISEY'S
NERVODYNE
Devitalizing Paste and Anodyne
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Builds Practice
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1317980, Dental appliance, Ira Lee, Seattle, Wash.

1317886, Preparing amalgam for dentist's use, Wm. M. Muchow, Evanston, Ill.

1317832, Artificial tooth, Vernon Spencer, Mosman, New South Wales, Australia.

53903, Design, Amalgam remover, Frank L. Grier, Milford, Del.

53904, Design, Alloy-scoop, Frank L. Grier, Milford, Del.

53955, Design, Dental plastic instrument, Daniel A. Zurbrigg, Milford, Del.

53956, Design, Dental carving instrument, Daniel A. Zurbrigg, Milford, Del.

53957, Design, Dental burnisher, Daniel A. Zurbrigg, Milford, Del.

53958, Design, Dental trimming file, Daniel A. Zurbrigg, Milford, Del.

1318351, Moistening attachment for dental handpieces, Ira A. Burnett, Chicago, Ill.

1318751, Therapeutic lamp, John J. Heitz, Chicago, Ill.

1318757, Lighting fixture, Paul M. Hotchkin, Chicago, Ill.

1318783, Combined direct and indirect lighting fixture, Earle C. McKinnie, Chicago, Ill.

1318586, Hypodermic syringe needle and base, Frank L. Platt, G. N. Hein, and R. R. Impey, San Francisco, Cal.

1319243, Hypodermic syringe, George G. Powers, Los Angeles, Cal.

1320133, Anchorage for dental bridges and plates, Steele F. Gilmore, Indianapolis, Ind.

1320337, Artificial tooth, Simon Myerson, Cambridge, Mass.

1320275, Device for extruding paste from tubes, Edwin G. Roach, New York, N. Y.

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1320824, Apparatus for casting dental inlays, Elpha E. Bailey, and J. H. Jacobs, Denver, Colo.

1320536, Automatic injection syringe, Raymond Di Falco and J. De Paul, Ellwood City, Pa.

1320583, Stand for dental articulators, Wm. M. Stanbrough, Newburgh, N. Y.

1321451, Multiple-jaw rubber-dam clamp, James W. Ivory, Philadelphia, Pa.

1321452, Rubber-dam punch, James W. Ivory, Philadelphia, Pa.

1321465, Dental film holder, Hector P. MacLagan, Park Ridge, Ill.

1321137, Facial contour restorer, Francis M. Morgan, San Francisco, Cal.

1321124, Restoring teeth, Albert D. Pentz, Jr., New York, N. Y.

1321126, Anchor for artificial teeth, George W. Ramsey, Washington, D. C., and G. E. Fritz, Chicago, Ill.

1321129, Dental drill, Frank F. Schlueter, Watertown, Wis.

1321130, Dental drill, Frank F. Schlueter, Watertown, Wis.

1322424, Forming metal backs for artificial teeth, Ernest Garden, Los Angeles, Cal.

1322355, Denture attachment and means for applying same, Herman Schreier, Sheboygan, Wis.

1322386, Dental articulator, Walter J. Wilson, Petersburg, Ind.

1322387, Motor-driven dental articulator, Walter J. Wilson, Petersburg, Ind.

1322994, Orthodontic appliance, Edward H. Angle, Pasadena, Cal.

1323181, Method and apparatus for administering anesthetics, Walter V. Goodfellow, Los Angeles, Cal.

1323141, Orthodontic appliance, Jacob L. Young, New Rochelle, N. Y.

Copies of above patents may be obtained for twenty-five cents each, by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

The Ten Commandments of Thrift

BY DR. FRANK CRANE

1. Work and earn. The first duty of every human being is to produce. No matter what your dreams and ambitions may be, no matter how idealistic and unselfish you are, you ought first of all to do some kind of work for which somebody is willing to pay you money. The first law of man is that he take himself off other people's backs.

2. Make a budget. That means an estimate of what part of your income you wish to spend for one thing and what part for another. A budget to a worker is as indispensable as a map to a traveler.

3. Keep a record of your expenditures. Money is hard, as hard as facts and figures. Don't guess. Know. The budget is intelligent looking forward; your record is an intelligent looking backward. Each depends on the other.

4. Have a bank account. If you have put your labor and care into earning money you don't want to lose it by your folly. Nothing human is absolutely safe, but the bank is the safest known place to put your money. Patronize the savings bank, where your money will work for you, as you worked for it. Idle money is as bad as idle folk.

5. Carry life insurance. If you live and love and work for your wife and children, why should you by your improvidence multiply their sorrow at your death?

6. Make a will. A few dollars spent in hiring a lawyer to draw up a sound will is better than many dollars spent by your widow hiring lawyers to straighten up your affairs.

7. Own your own home. Anchor yourself. Become a known and dependable part

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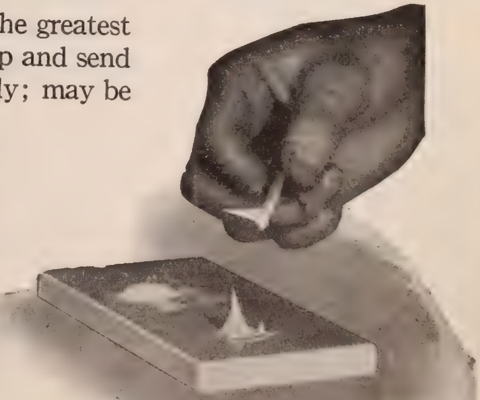

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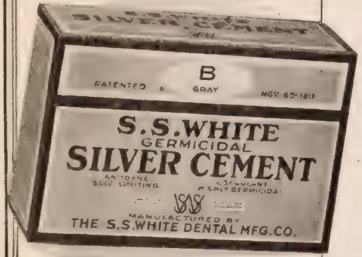

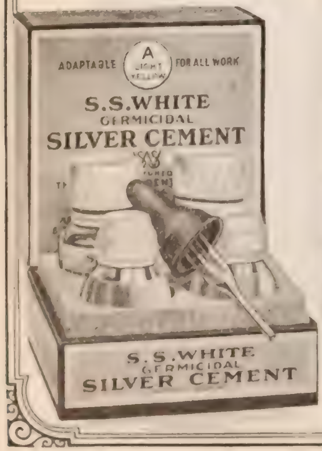

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REGULAR CONTRIBUTIONS

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL May 1920 No. 5

SPECIAL TECHNIC FOR REMOVAL OF ABNORMAL TEETH AND ROOTS*

HOLLOW, SPLIT AND EXCEMENTOSED ROOTS, ETC.

BY J. P. HENAHAN, D.D.S., CLEVELAND, OHIO

IN CONSIDERING various methods which may be adopted for the removal of a tooth, we cannot proceed intelligently without possessing a thorough knowledge of the tissues involved, including not only the tooth itself but the supporting tissues, in order that technic can be developed and accident and unnecessary injury avoided.

The maxilla and mandible in a general way may be described as irregular bones. Among others they possess, as of their defining characteristics, a prominent ridge of bone known as the alveolar process. The natural function of this process is to support the teeth. This process varies in size, thickness and shape in its various regions, according to the size and shape of the different teeth. It consists of an outer and an inner covering plate of dense, hard bone, which also varies in thickness and denseness in the several regions. Between these plates is a space occupied by cancellous bone (*Fig. 1*). Dipping down into this cancellous bone we find the several depressions known as the alveoli, which accommodate the roots of the teeth. The walls of these alveoli are very thin, in fact thay are hardly different from the cancellous bone, except in the fact that they are smooth and even and none of the small cancellous chambers of the bone open into the tooth alveoli. These alveoli are lined with periosteum, which is reflected onto the root of the tooth.

This cancellous bone forms an elastic yielding cushion or bed for the tooth into which it sinks slightly when pressure of mastication is placed upon it. In this way the sensitive peridental membrane is protected from injury.

The bones vary in hardness according to age, and are much more unyielding in the old than in the young.

The outer walls or plates of the alveolar process are entirely covered by periosteum. In the molar region the insertion of certain muscles of mastication may be found encroaching on the process. Underlying the molar region in the maxilla and varying in shape and size, will be found the antrum of Highmore, the protection of which always must be a consideration when removing the molars from the jaw.

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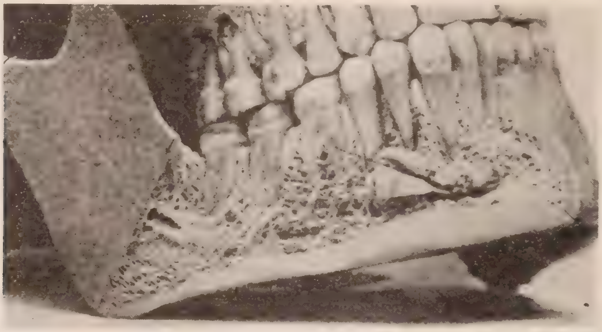
*One of a series of papers on Extraction of Teeth as viewed from the position of the twentieth century dentist, written for THE DENTAL SUMMARY.



(Cryer)

Fig. 1—Note extent of cancellated bone, also, the relative superficial position of buccal roots and anterior teeth. Walls of alveoli only limit cancellated bone tissue and have no thickness or strength as walls.

The mandible contains the inferior dental canal, which accommodates large nerves and blood vessels. This canal and its contents, like the antrum, often are injured by diseased teeth or during the operation for their removal.

The reflection of the mucous membrane of the cheek, the tongue, the floor of the mouth, the hard and soft palate and the pharynx, with the pillars and tonsils always must be borne in mind in planning and performing operations.

The tooth itself, when normal, is possessed of a peculiar texture and translucent color. The texture of the tooth varies with age and conditions and becomes dry and brittle when devitalized. At all times the tooth is a much harder tissue than the bone which supports it.

When we consider the removal of the tooth from its bony support, we realize that this operation is possible only because the interior of the bone is cancellous, and, therefore, yielding. If this were not the case and the bone as dense and solid in the interior as are its outer walls, it would be impossible to remove a tooth except with great labor in any case. As it is, a tooth may be removed because upon the application of certain definite force the cancellous bone yields and allows the passage of the tooth.

In certain types of disease of the teeth this cancellous bone, as well as the outer walls of the process, becomes condensed to a great degree of hardness, and, in consequence, the unyielding nature of the support prevents the loosening of the diseased roots in the socket and this, together with the fact that the tooth in these cases is dried and very brittle, creates conditions which make the operation for their removal very difficult.

Since the time of Chapin A. Harris, American dentists have followed certain rules for extraction of teeth. The rules as laid down by him and his co-workers are in the main, applicable to teeth retaining in the most part their original unimpaired outline and possessing their normal texture.

Many writers since the time of Harris have advanced their ideas in the form of rules for extraction of each individual tooth, but on the whole these ideas coincide with his, or are only slightly modified. Anyone with sufficient experience to judge will be convinced that Harris advanced his theories only after careful observation and study, based upon his own experience and the experience of his co-workers.

These rules, however, as stated before, are applicable only to teeth with crown and root intact or nearly so and normal in outline and position. They go no further and leave to the individual the task of devising for himself the method by which extraordinary cases are to be operated.

The theory of the mechanics of tooth extraction, as laid down in established rules, is part of the knowledge of every graduate dentist, but, like many other important branches of dentistry, such as prosthetics, bridge-work, periodontia and orthodontia, the subject of exodontia is receiving and reflecting study by scientific men, and the mere extraction of a tooth no longer is considered in itself a scientific procedure, unless that much of an operation is known to be the total requirement of the case, because in all considerations of extraction it must be understood that the aim of the operator will be to remove all infection and infectious growths before the operation is considered finished. For this reason, the teaching of exodontia in the future must be treated more from the standpoint of surgery than of mechanics.

Our study of pathology has shown the far-reaching effects of infectious growths developed in connection with teeth and, therefore, to remove only the tooth and nothing else, and assume *that* to complete matters in every case can only remind us of the pursued ostrich sticking his head in the sand.

The operation of tooth removal, like any other surgical procedure, is one which should be performed after sufficient preliminary study, showing all existing pathologic conditions possible connected with general or remote disease conditions, etc., and when performed should include eradication of all other diseased tissues, as well as the tooth itself which was the primary cause, and then the operation performed according to the best method for the particular case.

The aspect of tooth extraction has in many respects changed with the times. In days gone by the dentist was not confronted by nearly so great a variety of difficult cases of extraction as confront him today, and the percentage of these cases in number also has increased noticeably. This is the result of dental treatment which has caused changes in either texture or outline, or both, in the tooth root itself, and also produced changes in the bone immediately supporting it.

As has been said before, men have been removing teeth since history began and have believed simply that to be sufficient. The operation naturally was always the source of great pain, because anesthesia could not be satisfactorily produced, and for that reason more than any other, efforts to further perfect the technic were not attempted, speed being the chief desire. After the development of anesthesia, surgery saw its greatest advancement and today we see every surgical operation on a systematic basis for teaching.

Operations upon the eye, throat, nose, thorax, abdomen and extremities and elsewhere all are performed according to certain rules of surgical technic. The removal of teeth alone has been neglected in this direction, and it is time that an organized effort be made by the profession to improve the situation

When the average dentist thinks of a difficult extraction, he at once forms the mental picture of how much trouble will be met with before the tooth can be removed through the orifice of the alveolus. The idea that an easier method might be employed never enters his head.

The dentist who prides himself upon the high stage to which his mechanical skill has been developed, and who resents any imputation regarding his ability as a surgeon will, however, work and gouge and drill away indefinitely, bruising, lacerating and destroying tissue, because he never thinks beyond the methods which he learned years ago in college, and insists upon the performance of all cases according to one idea; the removal of the tooth through the alveolus with forceps.

Nothing is more discouraging to a dentist than to work an hour on a suffering patient and then abandon the effort and hope that nature will kindly finish the job, sometimes acting the small boy part and not confessing failure; or, on the other hand, to complete the operation after the laceration and destruction of much tissue, and to see the patient suffer for weeks, perhaps, from pain and infection.

This situation is seen every day, and will go on until more sane methods are devised and followed by the rank and file of the profession.

Another astonishing fact which is very noticeable reveals the almost total want of instruments for the performance of anything but the simple cases.

Forceps are used by most men for the removal of a tooth with a crown on it or for the removal of the apex of the root of the same tooth. This again is a reflection upon a profession, which prides itself upon the extent of its mechanical development.

How often we see cases following extraction when all the soft tissues have been removed in a great unsightly gap as far as the apex of the alveolus, and not only the bone but also the gum and periosteum on either side of the extracted tooth.

This situation always reveals the enormous trouble and nervous strain which the operator experienced and the length of time which he labored, to say nothing of the suffering of the patient at the time of operation and thereafter, and lasts throughout the lifetime of the patient, a testimonial of the lack of sufficient instruments, as well as of ingenuity and skill on the part of the operator.

Nearly all these cases can be operated with less difficulty, require less time and permit a much better and quicker result, if certain precautions are taken.

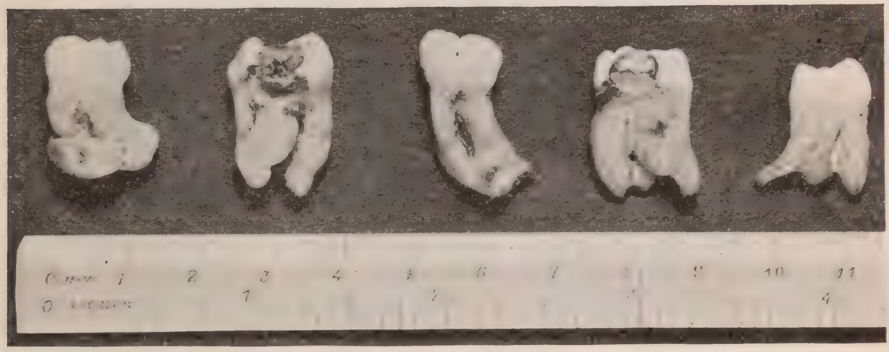


Fig. 2—Excementosis. All these teeth were removed from same mouth. The uppers gave little trouble. The lowers were very difficult to remove.

Excementosis in the upper teeth is not as a rule a factor in the cause of great trouble in removal of the tooth. It is a fact, however, that a slight excementosis in the upper bicuspid will result in more trouble than a much larger growth in the same space, because in the upper the direction of the tooth and the superficial position of the apex result in the excementosis eliminating the buccal wall, and in consequence much of the trouble in the removal of the infected tooth.

In the lower, however, the story is different. The roots are in the middle position of the bone between two walls which are thick and dense, and in consequence much effort is necessary to remove the excementosed tooth through this dense bone into which it has expanded.

The vitality of the tooth is a factor in these cases, because the devitalized tooth on account of its dry and brittle condition, is seldom able to stand the strain without fracture.

The sensible idea in these cases is to follow the simplest method which is practicable, and the buccal operation is the one suggested. (*Fig. 3*).

The bicuspid teeth very often present to us very difficult problems; close to the front of the mouth and of such shape that fracture easily results. Consider the lower bicuspids; small teeth, slender roots set in bone, where the outside walls closely approach each other and leave little room for cancellous bone in the interior space. This forms an unyielding support, and if the root is curved or excementosed or dried, the crown fractures off.

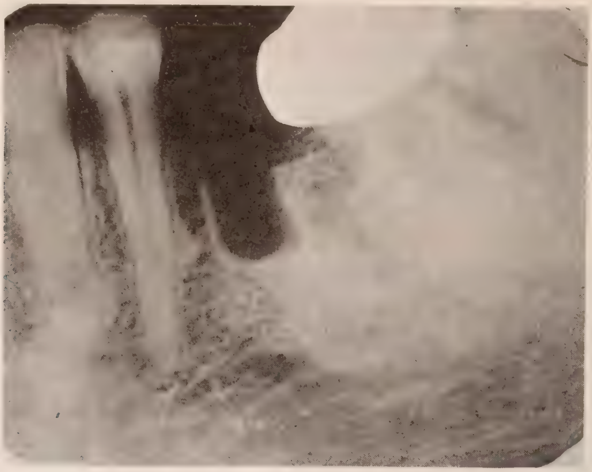


Fig. 3—Excementosed apical end of second bicuspid, too large to remove in ordinary manner without injury to other teeth and tissues. Removed after method shown in Fig. 4.

It readily can be seen that if removal were impossible by the forceps method when the tooth was intact, how nearly impossible it will be with nothing at all to grasp. It is here that a little mechanical judgment, coupled with surgical skill and judgment, will solve the problem quickly, completely, and, if not entirely pleasantly, at least easily.

Assume that we are removing the lower second bicuspid; the crown is gone and the root is excementosed. With a sharp knife make a clean incision through gum tissues and periosteum, in a line between the cuspid and first bicuspid and parallel to the roots, extending two-thirds the length of the roots; then with a concave retractor lift the periosteum from the neck and root of the first bicuspid, then over the root fragment of the second bicuspid, and from over the first molar also; the flap thus formed lays back and is held retracted to protect it from injury; then with elevators, chisels or burs, as the operator may select, remove the bone overlying the root and, if necessary between the roots, and the root comes out with very little effort.

The wound is carefully and thoroughly cleansed and the flap placed back in position. If necessary, a single suture may be placed to hold the edges in position, but often even this is not necessary, the blood clot taking care of it.

In a day we see quick repair with an organized blood clot in the socket, and the results generally resemble that which would be seen following a simple case of extracting. This method protects the periosteum and preserves it to further functionate in the regeneration of new bone to fill the space.

If on the other hand crude methods are followed, with use of forceps alone, the tissues are lacerated and destroyed and often anesthesia of the lip develops and persists for months; the result of injury to the nerves.

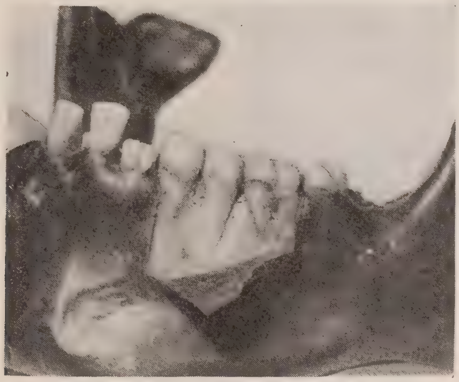


Fig. 4—Showing method of exposing root from side and cutting away bone for removal of tooth buccally.

Sometimes we see a lower incisor cuspid or bicuspid root submerged and with the crowns of the approximating teeth crowding, making the application of forceps impossible.

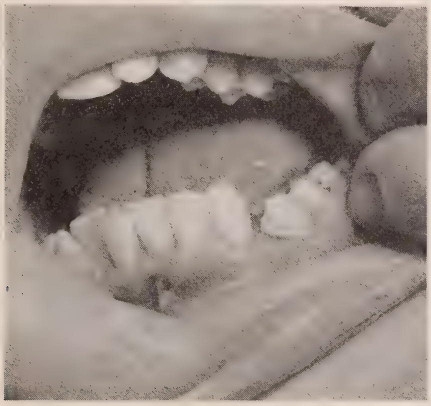


Fig. 5—Submerged first bicuspid root, with second bicuspid overlying. No space remains for application of forceps.

In these cases the root itself many times is not very firm and if slight force is properly applied will be removed easily.

This may be accomplished by making a small incision near the apex of the root and paralleling it. Through this incision we make an opening through the bone alongside of the root apex. This is done either with a bur or with an elevator forced through the bone alongside the apex of the root, which usually lifts out very easily when an elevator engages it.

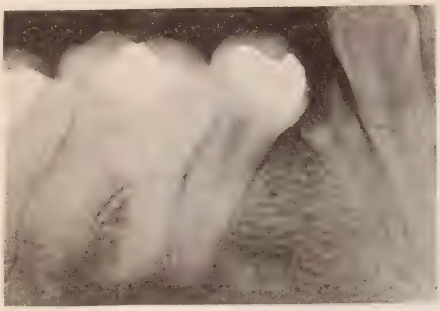


Fig. 6

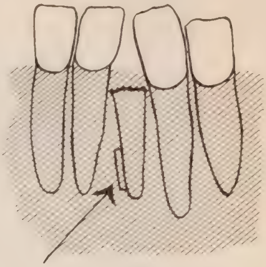


Fig. 7

Fig. 6—X-Ray of root in Fig. 5.
Fig. 7—Position for incision at apex of submerged root.

One of the most common conditions which we see is that of the hollow roots of the upper six anterior teeth. This is because of the frequency with which these teeth have been repaired by the application of a dowel pin crown. These crowns often come loose, and decay attacks the canal, eventually leaving nothing but a soft leathery shell, except at the apex, which is solid and firmly attached. The splitting of the brittle root also is often the cause of the loss of the dowel pin crown. The problem is to remove this tooth without breaking down the gum surface. An unsuccessful operation here results in a bad depression and scar which is hard to restore.

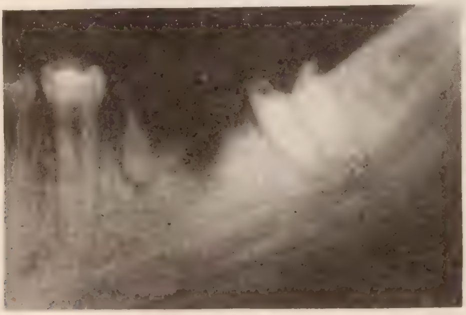


Fig. 8—Roots deeply set but not very firm. Easily removed by elevator. (See Fig. 12.)

This class of cases is extremely simple and, indeed, the same method may be applied to the more solid roots with great success. A concave chisel is worked up between the root and the socket wall, with enough force slowly applied to send it to the apex, first on one and then on the other side of the root, until the root is found to be so loose that it will fall out on the blade of the chisel, saving all injury to bone, periosteum and gum.

Lower molar roots which are not so firmly set but are deep in the tissue (*Fig. 8*) easily are removed by the application of a suitably-shaped elevator, such as the Cryer (*Fig. 9*), or Knot (*Fig. 10*), right and left root elevator, or Henahan's number one elevator (*Fig. 11*).

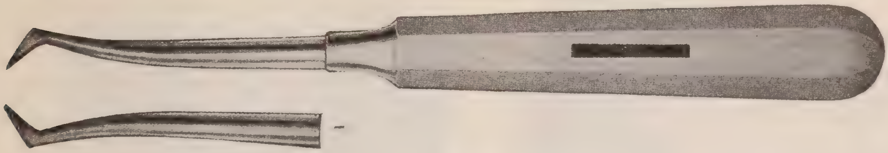


Fig. 9

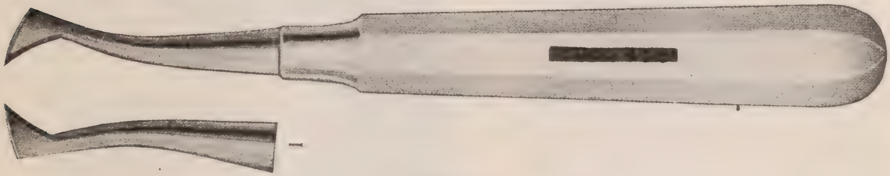


Fig. 10

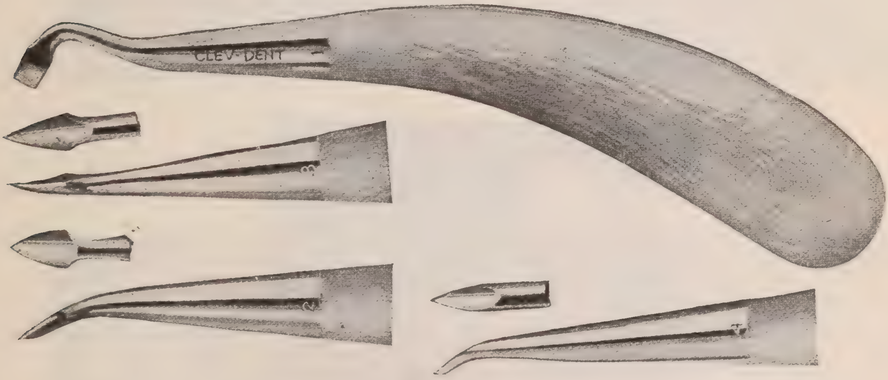


Fig. 11

Fig. 12 shows the method of application of the Henahan number one elevator for the removal of lower molar roots. If the roots are not extremely firm the simple wedging of the instrument will loosen, and a turn of the blade will scrape them out; this instrument also acts well as a curet.

The lower third molar when in a normal, or closely approaching a normal, position in the bone, even though not entirely erupted or perhaps with the crown entirely removed, is best removed by the use of an elevator.

An instrument well adapted for that purpose is number three, (*Fig. 11*). It is slowly inserted into the bone so that the end is wholly sunken as in (*Fig. 15*). A slow turning will loosen and remove the tooth; if tooth still holds in socket, elevator number two (*Fig. 11*), is applied buccally.

The removal of an impacted upper cuspid many times is fraught with great danger to the other tissues. Many accidents can occur if negligence is permitted. If the tooth is deeply buried in the tissues it may be forced into the nose or the antrum. If lying close to the roots of the other teeth injury may occur to them, or if unguarded force is exerted other teeth may be forced from the socket, or the alveolar process bearing other teeth may be fractured. This operation always should be performed carefully with regard to anatomical structures which may be involved in order that they may not blindly be injured.

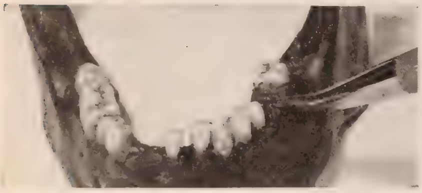


Fig. 12

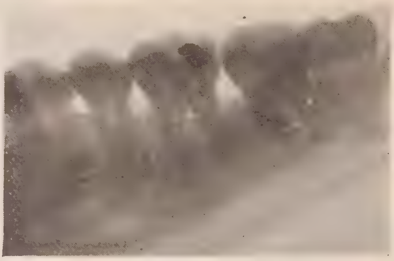


Fig. 13

Fig. 12—Method of applying elevator for removal of the roots of the six- or twelve-year molars when not very firmly retained.

Fig. 13—Lower third molar in straight position but retarded in eruption.

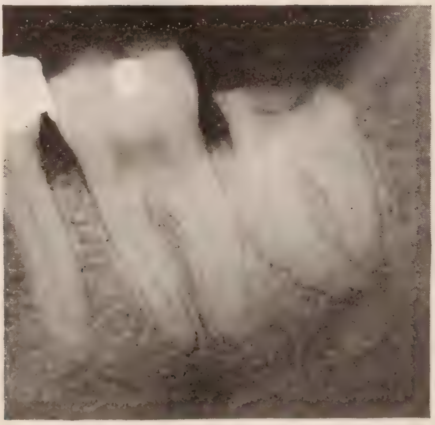


Fig. 14—Lower third molar with crown fractured away below the gum line.

Fig. 16 shows a typical and common type of impacted upper cuspid, and *Figs. 17 and 18*, methods of uncovering and removing the tooth.

The incision as shown in *Fig. 17* must be made so as to avoid the incisive vessels and nerves, thereby eliminating a violent hemorrhage. The periosteum also must be carefully lifted up so as to protect it from injury. In *Fig. 18* the tooth is seen exposed, after which each case becomes a law unto itself.

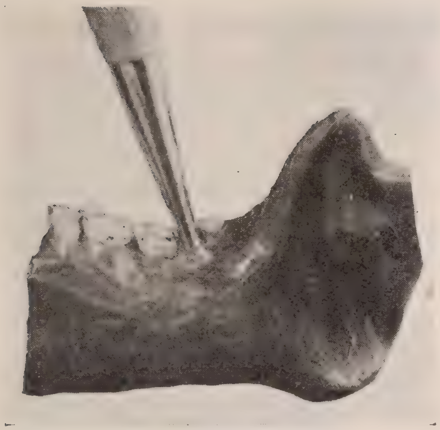


Fig. 15

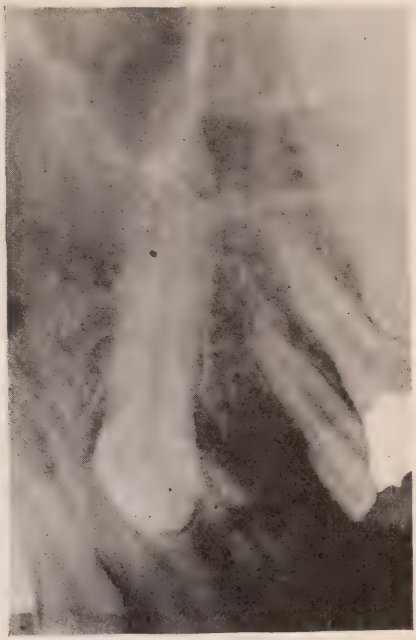


Fig. 16

Fig. 15—Application of elevator for removal of teeth as in Figs. 13 and 14.

Fig. 16—Common type of impacted cuspid, cusp encroaching on roots of the lateral and central.

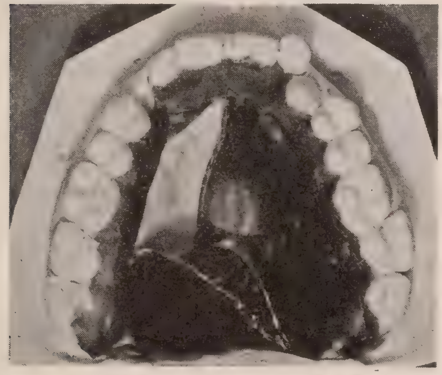


Fig. 17

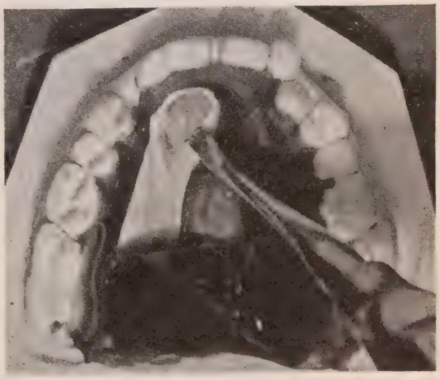


Fig. 18

Fig. 17—Method of forming flap for removal of impacted upper cuspid.

Fig. 18—Method of resection of bone for uncovering tooth. Instruments in position for loosening tooth.

After operation and thorough cleansing the flap is carefully laid back and edges approximated. In a large percentage of cases, but not in all, healing takes place without delay, a firm clot fills the space and, if no infection is present, remains. Infection disorganizes the clot and makes post-operative treatment necessary.

Rose Building.

CAST MAKING*

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"IN THE SPRING a young man's fancy lightly turns to thoughts of love," and outward evidence of the turning appears in washed face, clean shirt and combed hair. When a dentist awakens to higher prosthetic ideals, the earliest evidence of the awakening is seen when he begins to pour his impressions with some material other than plaster.

An accurate impression is indispensable in securing a satisfactory denture; every dentist will concur in this judgment. An accurate cast is of equal importance; dentists who pour their impressions with plaster show (by this very act) that they do not here concur.

As a preliminary to the presentation of practical phases in the making of accurate casts, the writer wishes to register a protest against the inaccuracy in speech which is chargeable to leaders in the profession and which results in much confusion of "cast" and "model." A prosthetist, without necessarily assuming a finicky, sensitized attitude, regards the inaccuracy quite as culpable as the popular reference to an abscessed tooth as "ulcerated." A model is something that in whole or in part is to be reproduced. A cast is something that has been cast (thrown), or poured, or formed out of plastic material. The jaws are our models which we reproduce in the casts. Since we do not reproduce the cast which is usually a negative form to the finished product desired by the prosthetist, we are wholly unjustified in calling it a model. The wax denture ready to flask is a model, and the dentist endeavors to reproduce (excepting the teeth) this wax model in vulcanite. To avoid this confusion of terms, "pattern" and "cast" may be used in dental terminology, while the word "model" may be left out of the guilty dentist's vocabulary for a few months or even years.

After the impression is removed from the mouth and washed free of small particles of plaster it is allowed to dry for ten or fifteen minutes, or, if the dentist is in a hurry, a stream of compressed air may be directed against it, or it may be placed in front of an electric fan when it will soon be ready to be varnished or to be dipped into a solution of flexible collodion. The employment of the proper kind of varnish or coating material for casts is worthy of emphasis, since a free removal of the cast from the impression will avoid scarring the cast during the process. There are a number of patent preparations on the market and our journals are well supplied with advertisements of various separating media. The writer has tried practically all of them and still clings to the alcoholic solution of shellac as a filler and to a similar solution of gum sandarac as a varnish. Care in preparing these solutions will be repaid. If large quantities are prepared at a time the results usually will be more satisfactory. Approximately three and one-half ounces of shellac dissolved in sixteen ounces or a quart of non-beverage grain alcohol is the proper proportion, and this should be shaken occasionally for a day or two and then filtered free from any heavy or partly undissolved particles, using fine filter paper in the process. The filtering process will result in an evaporation of some of the alcohol, which finally gives about a twenty-two or twenty-three per cent. solution. The proportions for the varnish are the same, using gum sandarac instead of shellac.

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*This is the fifth of a series of twelve articles being written by Dr. Campbell, especially for THE DENTAL SUMMARY.

*EDITOR'S NOTE: Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

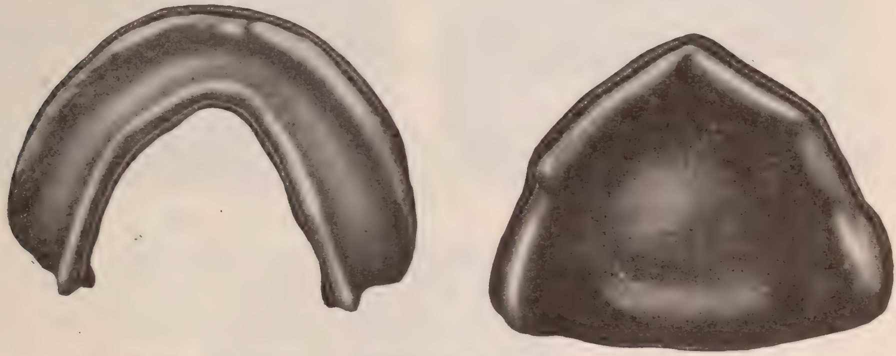

Fig. 1—Upper and lower impressions with wax wire in position. This wax roll indicates the line to which the plaster will come in the process of boxing.

When the impression has been dried it is then given two or three coats of the shellac filler. The first coat is applied immediately after the impression is dried, a second one after it is boxed, while the third one, if necessary, may be applied after the boxing has been trimmed. At any stage, whether the impression is ready for another coat may be determined by touching to the face; if the last coat is still sticky it has not yet dried sufficiently. The trimmed boxing now may be covered with one or more coats of the sandarac varnish, depending upon the thickness of the varnish, which will increase and therefore improve for a month or two after making when it will have reached a consistency that will in most instances be more satisfactory.

To facilitate the manipulation of the plaster during the boxing of the impression, a roll of wax about the size and length of a darning needle may be placed around the impression and up to the point on it which is to be incorporated in the finished denture. *Fig. 1* shows this wax wire in position.

A mass of plaster is mixed thick enough to stand while the impression is pressed down into the body of the mass, and poured out upon a smooth level surface. The impression is pressed down into this mass until it touches the wax wire, when with a wet spatula the mass is shaped up to the wire in all places and also made to assume the desired form as indicated in *Figs. 2 and 3.* The boxing should be at least an inch thick at the point of least depth. *Fig. 4* shows the upper impression housed or boxed and trimmed ready to receive the rubber matrix into which the cast material is to be poured.

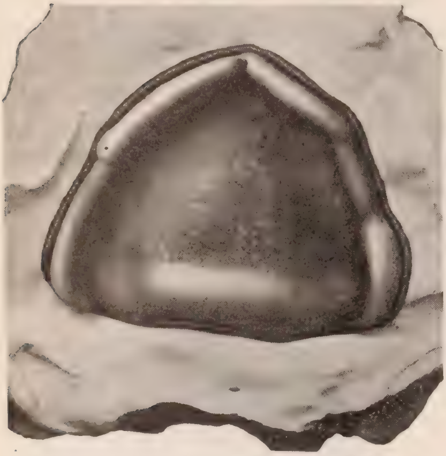

Fig. 2

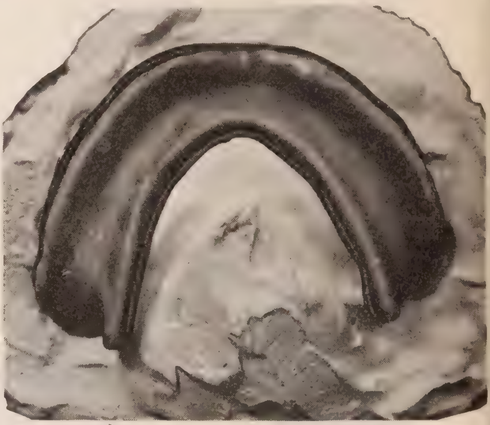

Fig. 3

Fig. 2—The upper impression pressed into the mass of plaster until the wax wire is reached, when a wet spatula is used to bring the plaster up against the wax along its entire length.

Fig. 3—The lower impression pressed down into the mass of plaster up to the wax wire.

The matrix which encircles the housed impression may be made of waxed cloth, thin lead sheet, or a piece of an old auto tube. The writer prefers to use the latter since in his hands it is more easily manipulated. An absolutely straight piece of an inner tube about two by twelve inches is placed around the boxed impression, the lap being made at the posterior portion and held in place with a wide rubber band about four inches long. The rubber matrix is shown in position about the lower. (*Fig. 5.*)

This matrix-housing-impression unit is now placed in a bowl of water to become saturated while the Spence or Weinstein compound is being mixed. The writer prefers the Spence compound for full dentures and the Weinstein compound for partials. While the Spence compound usually is mixed after a guess formula, a definite formula for mixing is given for those who are beginning its use. In a clean, dry bowl one measure (for vulcanite casts one ounce of water is sufficient; more will be required for casts upon which metal bases are to be swaged) of water and three level measures of Spence's compound are mixed together. Mixed in this proportion the result will be of about the consistency that the dentist usually requires when he is using plaster. This is thoroughly mixed and stirred, and then as much of another measure as can be incorporated is added. This addition will depend upon the operator's knowledge and skill, but it may be observed that the larger the amount of the compound that can be worked into a given amount of water, the greater the density, which in turn reduces the compressibility of the resultant cast. Thirty minutes after the cast has been poured the matrix may be removed and the cast trimmed up evenly.

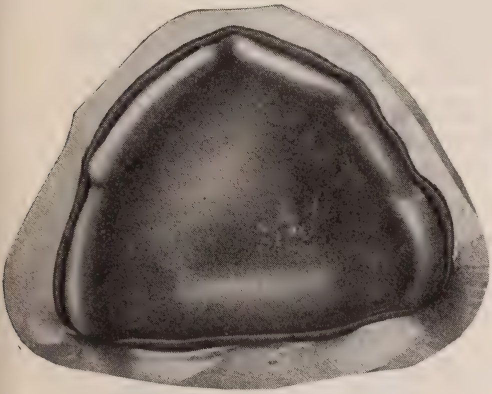

Fig. 4

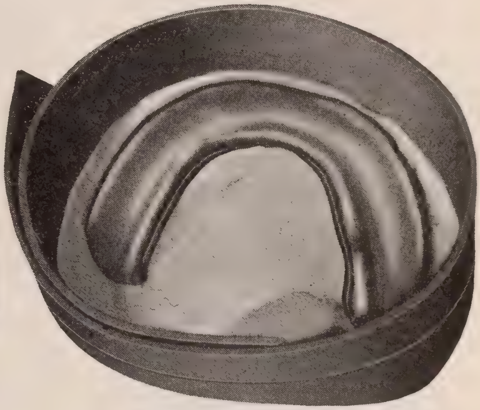

Fig. 5

Fig. 4—The upper impression boxed and trimmed ready to receive the rubber matrix into which the cast material is to be poured.

Fig. 5—The lower impression boxed, trimmed, and provided with the rubber matrix.

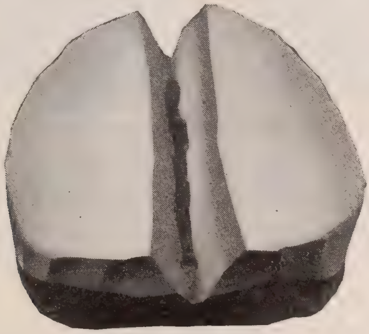

Fig. 6—Showing V-shaped fissure cut through the plaster as an aid in removing without fracturing the cast.

If the case is placed upon a radiator or in some place where it may be heated and continued at this temperature, say one hundred and twenty degrees Fahrenheit, it may be opened safely at the end of two hours, although the earlier it is opened the greater the danger of fracturing the cast during the process. A more acceptable cast—one that is of greater density, less friable, and more dependable in every respect—will result from leaving it to stand during the night. The cast is separated from its plaster housing by cutting a V-shaped fissure through the longest diameter of the plaster or through what might be termed the median line, down to the black tray compound (in case of the upper as shown in *Fig. 6*; in the lower, cut until the shellac-stained housing is reached). The cast is grasped firmly in the palm of the left hand, while with a small mallet the housing is gently tapped toward the center. Beginners may exercise additional precaution to avoid fracturing the cast, if they will cut another V-shaped fissure directly across the first one. The black tray compound may be splintered off by prying beneath the heels of the individual tray. A dull knife is best for this purpose, since any slips will be less likely to mar the cast; the back of the blade is even more satisfactory. The plaster impression easily may be removed. Instead of trying to slip the knife between the cast and the plaster, the dull knife blade is forced down and in at right angles to the cast, but before touching the cast is turned slightly to the right or left, thus using the plaster as a fulcrum for the blade, which will result in portions of the plaster being chipped away.

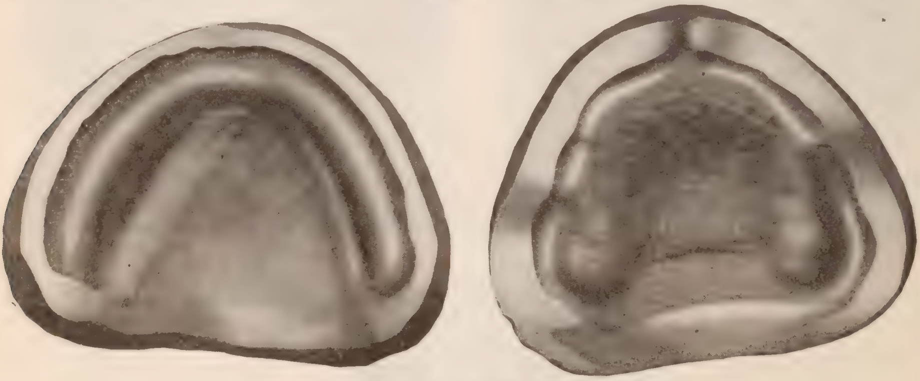

Fig. 7—The finished casts.

The cast should be treated with the same respect that the dentist accords a wax pattern for a gold inlay, because any imperfection in the cast means imperfection in the finished denture. While some imperfections may be so slight that they may be overlooked, they are sufficient in many instances to keep the denture from going to place.

After trimming away and reducing the overhanging sharp margins of the border of the cast to a point where the desired border of the denture will come, as in *Fig. 7*, the cast is ready for the construction of occlusion models or bite plates. The construction of these occlusion models will be discussed at length in the June issue of The Dental Summary, under the caption, "Taking The Bite."

FUNDAMENTALS OF OPERATIVE DENTISTRY

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INTRODUCTION TO OPERATIVE DENTISTRY

OPERATIVE DENTISTRY is the science and art of the preservation or restoration of the natural teeth in or to a state of health and beauty. It is dentistry of the *chair* in contra-distinction to Prosthetic Dentistry which is largely dentistry of the *laboratory*. Its functions are (a) *Preventive* (prophylactic) and (b) *Restorative* (surgical or mechanical), of which the former is now considered the more important.

The practice of Operative Dentistry is based on a thorough knowledge of such fundamental subjects as Anatomy, Histology, Biology, Physiology, Pathology, Bacteriology, Chemistry and Materia Medica; an adequate comprehension and frequent application of the laws of physics and mechanics; as well as on the possession and exercise of the artistic sense.

Although the principal field of action of the operative dentist is the oral cavity, it is necessary for one who aspires to succeed, to any great degree, in this particular branch of a noble and elevated profession, to become, at the beginning, deeply imbued with an all-important, ever-pervading *truth.* And that truth is this: *the oral cavity is intimately and closely associated with all other parts of the body, by way of the nervous, vascular and lymphatic systems.*

This fundamental truth being thoroughly perceived, two additional ones may then be readily deduced: *first,* that pathologic disturbances in the mouth have a far-reaching influence on the production of diseases of other tissues; and *second,* that the teeth and supporting structures are equally subject to disturbance of their normal functions, from abnormal conditions in distant parts.

The average dentist has in the past been too frequently interested in the question of restoration of tooth structure through various mechanical procedures. He has possessed a very narrow view of the broad scope of his profession, and he has not fully realized the importance of the great truths above inculcated, with the result that often he himself, and the public at large, have not appreciated the dignity of his calling and its far-reaching influence on the health and well-being of society.

It shall be the constant aim of the writer throughout the following chapters to emphasize the intimate connection existing between the various local and constitutional pathologic disturbances, and the likelihood of producing disease processes in other parts of the human organism, through an imperfect realization, on the part of the dentist, of the dangers of oral foci of infection and imperfect dental operations. And, *vice versa*, it shall also be his task to emphasize the important bearing disease processes in distant parts continuously exert on questions of diagnosis and treatment of many of the oral manifestations of these systemic disturbances.

It is true that Operative Dentistry is largely concerned with a description of operations of a mechanical or surgical nature; but the reader should constantly bear in mind that these operations are performed on vital tissues, and that always the health, and frequently the life, of the patient is involved. Therefore, the patient has a legal and a moral right to expect and demand intelligent and scientific service, based on a full realization of the above truths, on the part of the Operative Dentist.

The correct performance of the various operative procedures described in the following chapters requires the development of the highest degree of manual skill and dexterity, great delicacy of touch and manipulation being essential. Each individual step or stage of every operation must be completed in detail, before proceeding to the next, if a perfect result is to be attained in the finished operation. Dentistry is a profession of *detail*, and in no vocation is a realization of the importance of detail in the performance of the manifold mechanical procedures more essential. So delicate are many of these manipulative procedures, that the use of high-power lenses frequently is required to perfect the work before it can be called a finished product. It is hoped that this will be perceived by the reader and constantly borne in mind during the performance of the various technical operations.

The possession and development, to a very high degree, of the artistic sense is essential to the successful practice of Operative Dentistry. Courses in drawing, modeling, carving and shading, are now included in the curriculum of modern dental colleges, in order that an adequate comprehension of line, contour, proportion and color may be obtained by the student. The artistic contour of a filling, the proper shading of a porcelain restoration are of equal importance to the perfect mechanical adaptation of the finished product. The completed piece should so harmoniously blend in with the work of nature, that original line and color are preserved or restored and the work of the operation is as inconspicuous as possible. "The highest function of art is to conceal art."

It is now perceived that the necessary attributes to the successful practice of modern Operative Dentistry are manifold. It is the earnest wish of the writer that this will be at once realized, and that the reader of the following pages will diligently apply himself to their attainment.

HYGIENE AND LIGHT IN THE OPERATING ROOM

The maintenance of proper light and correct hygienic conditions in the operating room is of extreme importance. This should be borne in mind in the selection of a location. Many dentists today are practicing their profession in rooms which are poorly lighted, imperfectly ventilated, and with unsanitary heating and plumbing arrangements. These conditions must necessarily lower the efficiency and productive power, and shorten the period of usefulness of those who are working in them.

The dentist spends one-third or more of the productive period of life in his operating room, and if his surroundings during that time are of an unhygienic nature, or if he is working under conditions tending to the production of eye strain, he will be the sufferer sooner or later. Many young men have entered the practice of dentistry before having matters of this nature brought to their attention, and have been compelled to learn of them through sometimes bitter experience.

The eyes are one of the principal assets of those following the profession of dentistry, and since they are possibly the most delicate organs of the entire body, they should not be neglected. The dentist should see to it that he is working at all times in a light which is not productive of eye strain, and he should be careful, if he suspects the possibility of beginning eye trouble, to consult a competent oculist at once.

73. Why is the maintenance of proper *Hygienic Conditions* and *Lighting Arrangements* in the operating room important?

For preservation of the health and eyesight and prolongation of the period of usefulness of the operator.

74. Name six *Conditions* essential to the *Ideal Operating Room.*

First, proper ventilation.
Second, abundance of sunlight.
Third, modern heating arrangements.
Fourth, sanitary plumbing.
Fifth, correct exposure.
Sixth, proper lighting facilities.

75. Describe the method of properly *Ventilating* the operating room.

The windows should be open sufficiently (preferably from both top and bottom), to allow a frequent supply of fresh air, both in winter and summer. At the same time, neither operator nor patient should be directly exposed to a draft.

76. Why is the frequent admission of *Sunlight* important?

Because sunshine is a great purifier and a foe to germs and disease. The operating room should be one which is capable of flooding with sunlight several times a day.

77. Discuss the question of proper *Heating Arrangements.*

The room should be maintained at a temperature of sixty-eight or sixty-nine degrees Fahrenheit in winter. Overheated rooms lower the efficiency and productive power of the operator. Electric fans, properly placed to avoid drafts, should be kept running during hot weather. Hot air furnaces are objectionable, from the fact that they often supply air from unclean, damp cellars, frequently contaminated with sewer gas; consequently, hot water or steam is the preferable mode of heating.

78. Why is *Sanitary Plumbing* important?

To protect operator and patient from the dangers of unclean and germ-laden water, and the inhalation of noxious sewer and illuminating gases. Supply and drain pipes should be freely exposed to view, all drain pipes properly trapped, and gas pipes and fixtures frequently inspected for possible leakage.

79. What is the best *Exposure* for operating, and why?

Some operators prefer a direct northern light. The disadvantage of this exposure is in the fact that after the early morning hours the sun is largely excluded and sufficient light for operating is not always obtained. The ideal arrangement, in the opinion of many, is a corner room with two windows, one of which faces the *east*, the other the *south* (*Fig. 50*). With the chair facing the east window and the south window at the operator's back, an abundance of light is present at all times, while the sun will not be a disturbing element, either in the morning or afternoon.

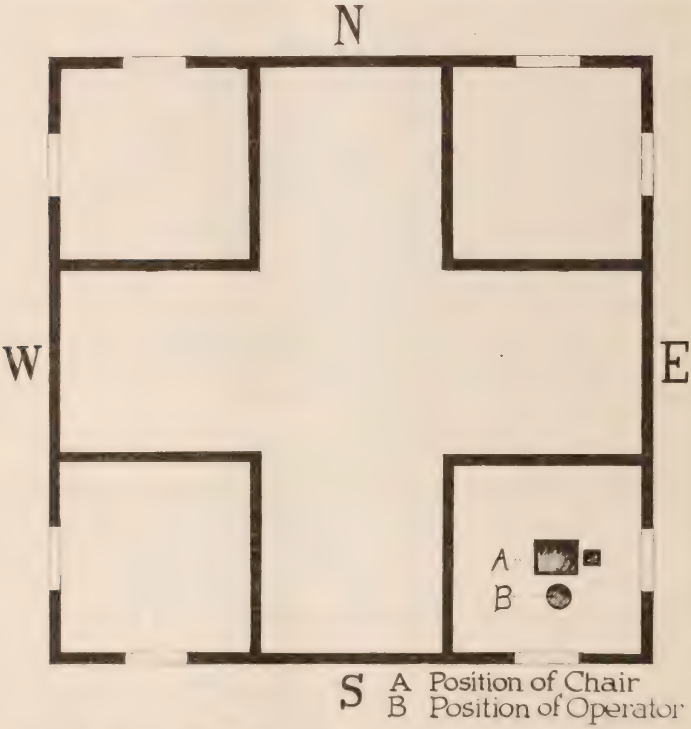

Fig. 50—Diagrammatic drawing showing ideal exposure.

80. What seven *Rules* should be observed in regard to *Light* in an operating room?

First, avoid *bright walls,* which reflect the light into the operator's eyes; rather select green and brown colors, which are more restful.

Second, avoid *flooding the entire room* with light, especially the lower portion, toward which the operator's gaze is frequently directed, but rather concentrate the light on the *field of operation* and keep the balance of the room more or less in shadow.

Third, never face a window; in case one is present, keep the shade drawn. Neglect of this precaution is frequently productive of great injury to the eyes.

Fourth, avoid *very large windows,* which flood the room with too much light; if present, keep a portion of them shaded. An excellent plan, in some instances is to equip the operating windows with two separate shades, one at the top and one which will allow pulling up from the bottom. In this way the light may be conveniently regulated at any period of the day.

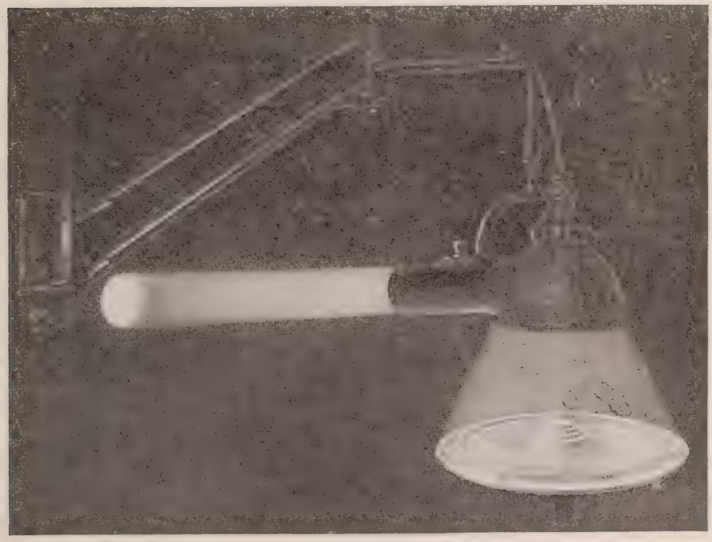

Fig. 51

Fifth, if possible, admit most of the light from a window *at the operator's back.*

Sixth, avoid bay windows, which as a rule admit an excess of light and require a great deal of shading.

Seventh, make provision in the form of one of the many special artificial *light reflectors* (*Fig. 51*) for use on dark days and whenever needed.

ASEPSIS IN THE OPERATING ROOM

Since the introduction of aseptic methods into the practice of surgery, the subject of asepsis in the dental office has gradually become a matter of great importance, until today operations are performed, insofar as conditions will admit, under aseptic precautions in all modern dental offices. The dentist who neglects to sterilize his instruments or to take all possible precautions to prevent infection, and who does not fully realize the dangers of such neglect is daily rendering himself liable to suit for malpractice.

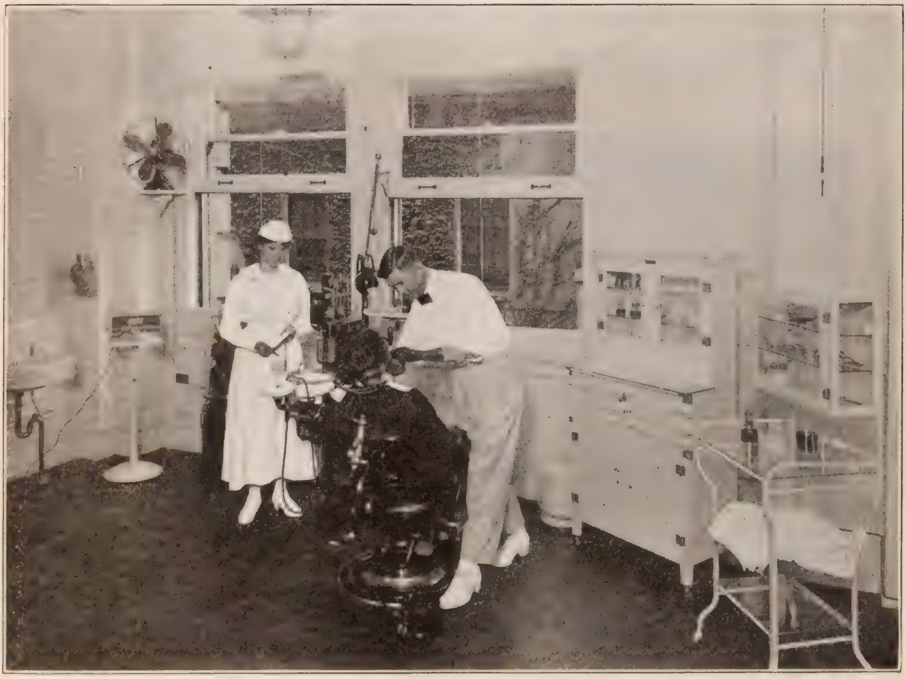

Fig. 52—Ideal operating room.

Dental operations performed in the oral cavity, (which is an ideal incubator for germs of all kinds), with unclean hands and instruments, are likely to produce grave infections of the soft tissues, with consequent injury, systemic infection and possible death of the patient. Leeuwenhoek, the great Dutch scientist, as early as the eighteenth century said: "More animals live in our mouths than there are people in Holland." The danger of transmission of disease from one patient to another, and the infection of the operator himself under such conditions, is very great. For these reasons, as well as on account of the well-known fact that many diseases are transmissible by way to the clothing, the chair, upholstery, draperies, drinking glasses and similar articles, it is incumbent upon the dentist to take all possible precautions to avoid such occurrences.

Everything in the reception and operating rooms, including the furniture, floor coverings, draperies and other equipment, should be insofar as possible, of an easily cleansible nature (*Fig. 52*), and should receive regular and systematic care and attention. Although it is impossible, under the conditions in which the dentist is working, to carry out the methods of aseptic surgery as practiced by the general surgeon, this should be done, so far as circumstances will permit, after the methods herein described. It is a duty which the dentist owes to his patients, as well as to himself.

In addition to the bacteriological and dento-legal aspects of the subject, there is another very important one, which should appeal to young men just entering the profession. The intelligent use of aseptic methods will appeal to the average patient and be of great assistance as a practice-builder. Patients of even ordinary intelligence appreciate cleanly methods of operating. If they observe that strict precautions are being taken in the sterilizing of hands, instruments and appliances, a psychological effect is immediately produced, the advantage of which readily may be perceived.

This latter argument for the practice of aseptic dentistry is, however, a minor consideration in comparison with the others advanced. In fact, it is unnecessary to mention it at all if the student has acquired a comprehensive knowledge of bacteriology and the germ theory of disease. If so, he will at once realize the necessity for proper care, for scientific reasons alone.

81. Why are *Aseptic Precautions* necessary in the operating room?

On account of the danger of transmitting disease from patient to patient, or from patient to operator.

82. Name some of the *Contagious* and *Infectious Diseases* capable of transmission by way of the clothing, draperies, chair covers, office furnishings, unsterilized instruments and hands.

Measles, diphtheria, scarlet fever, chicken-pox, small-pox, whooping cough, influenza, tonsillitis, stomatitis, malignant œdema, pneumonia, tuberculosis, syphilis, suppurative inflammations and putrescent conditions in general.

83. Is the *Mouth* very susceptible to *Infections*?

Yes. It is constantly teeming with micro-organisms, since it offers special inducements for their location and multiplication, such as heat, moisture, food debris and dead epithelial cells.

84. Do the tissues of the mouth *Resist Inflammatory* and *Infective Conditions* more than other portions of the body?

Yes. This was once thought to be due to some antiseptic principle in the saliva, but it is now attributed to the high resistive power and great vitality of the tissues, consequent on their excellent blood supply and nourishment. It is claimed, however, that the saliva does exert a phagocytic action on certain micro-organisms.

85. Give the *Scheme of Dental Sterilization.*

First, sterilization of the *office and appliances.*
Second, sterilization of the *operator.*
Third, sterilization of the *field of operation.*
Fourth, sterilization of the *instruments.*

86. Describe the method of sterilization of *Office* and *Appliances.*

A. Avoid draperies, floor coverings, wall paper, plush chairs, drawer linings and materials in which dust and germs are liable to accumulate. Adopt hardwood, tiled or linoleum-covered floors, which should be washed frequently. Any necessary rugs, draperies and drawer linings should be removable, frequently cleansed and exposed to the sun. The walls should be tinted in a suitable color to avoid eye strain, and frequently cleaned. The chair-seat, arms and back, should be either cane, leather or wood (*Fig. 53*), and should receive regular attention.

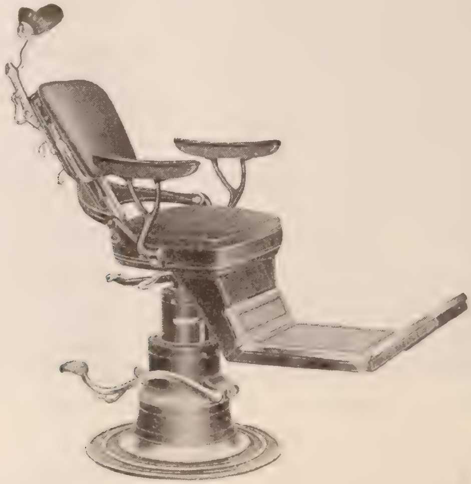

Fig. 53

B. Select cabinets (*Fig. 54*), tables (*Fig. 55*), and drawers of some readily cleansible material. Many modern operators prefer white enamel and glass. All of these should be frequently cleansed.

C. Change frequently and keep scrupulously clean all necessary table covers, towels and napkins. Avoid laundered towels and napkins, selecting specially prepared sanitary paper substitutes.

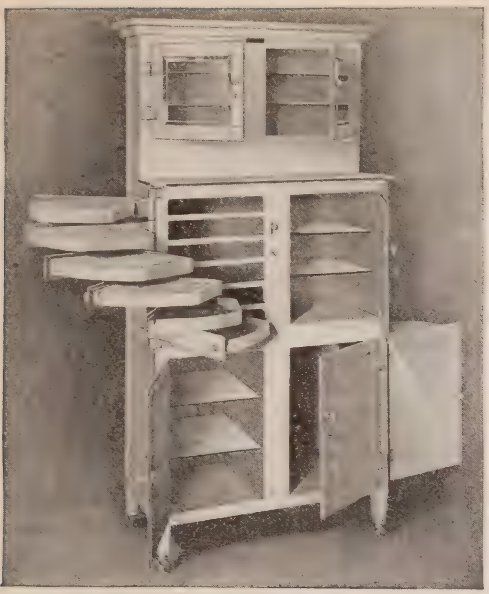

Fig. 54

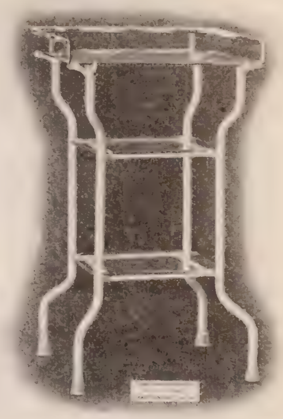

Fig. 55

Fig. 54—White enameled steel dental cabinet.
Fig. 55—White enameled table.

D. Pass an antispetic solution at frequent intervals through the saliva ejector and fountain cuspidor (*Fig. 56*). Boil all saliva tubes, drinking cups and glassware.

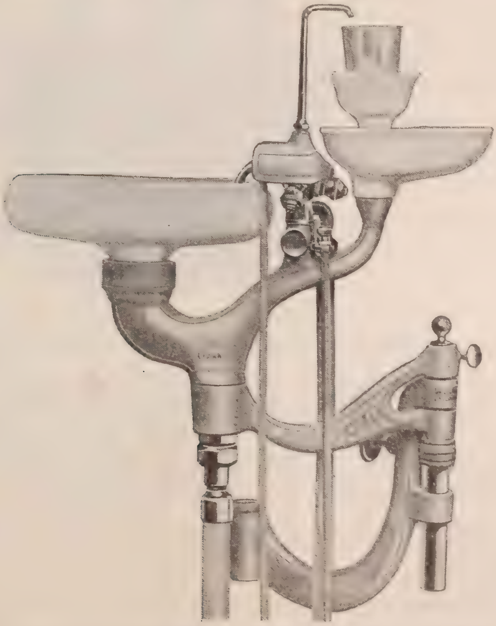

Fig. 56—Fountain cuspidor and saliva ejector

87. Describe the *Sterilization of the Operator.*

He should set an example for cleanliness, through daily baths and frequent changes of linen. He should wear a clean, white operating coat or gown in the operating room at all times. He should avoid long hair and adopt the clean-shaven face. His mouth and teeth should be in a healthy condition and his breath free from odors. His hands, one of his principal assets, should be kept scrupulously clean and his nails close-trimmed, neat and smooth. His hands should be scrubbed with a brush and antiseptic soap in running hot water, and then rinsed in alcohol, before operating. In special cases of infection, syphilitic patients and surgical operations, they should, in addition, be immersed in a 1 to 2000 solution of bichlorid of mercury.

88. Describe the sterilization of the *Field of Operation.*

At the *beginning* of a series of operations, the patient's mouth should be freed of all calcareous deposits and badly broken-down roots, the teeth thoroughly polished, and diseased gums treated. At the beginning of each "sitting" the use of an antiseptic mouth wash is advisable, or spraying of the mouth with a syringe or De Vilbiss Spray Bottle containing a good antiseptic (*Fig. 57*). If the circulation is to be entered, in addition to the above precautions, the part to be operated upon should also be painted with dilute tincture of iodin.

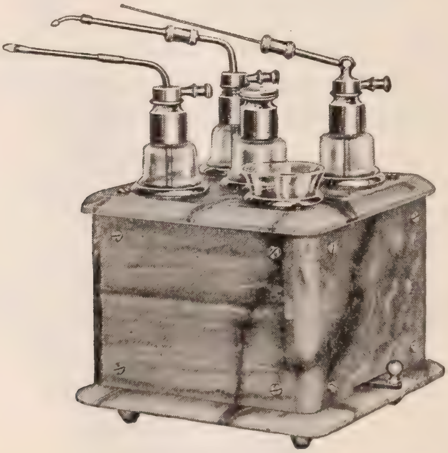

Fig. 57—Electric heater and spray bottles

89. What two general methods are in use for the *Sterilization of Instruments?*

First, sterilization by drugs.

Second, sterilization by heat.

90. Describe two methods of *Sterilization by Drugs.*

First, immersion of the instruments in an antiseptic or germicidal solution, such as formalin, five per cent.; phenol, one to one hundred; or hydronaphthol, three to five per cent. solution. Formalin solutions produce rusting of instruments, unless borax in small amount be added. Mercuric chlorid cannot be used for this purpose on account of the same tendency. *Immersion in any antiseptic solution is a very unreliable method.*

Second, vaporization by heat of formaldehyde gas, either from formalin solutions or from paraform (solidified formaldehyde). The addition of a small amount of borax prevents rusting. This is usually a more valuable method of sterilization than the preceding one.

91. Name some *Formaldehyde Sterilizers* and tell on what principle they work.

The Schering, Low, and Paynter Formalin Sterilizers. The instruments, after being thoroughly cleansed with soap, water and brush, are then dried and placed in a special compartment in the sterilizer designed for their reception, after which the formaldehyde gas is liberated from paraform by lighting the burner underneath. The gas permeates throughout the sterilizer, thus coming in contact with the instruments. The method is not considered very reliable.

92. Name some *Steam Sterilizers* and describe the method of their use.

The Castle, Lee S. Smith & Son, Pelton & Crane and Rochester Steam Sterilizers. After thorough mechanical cleansing with brush, soap and water, boil in water to which has been added a small amount of sodium carbonate or bicarbonate, for fifteen minutes. Then dry *thoroughly* on a sterile towel. The addition of the sodium salt prevents to some extent the tendency to rusting, although *absolute drying* is essential.

93. What *General Method* of sterilization is *Most Efficient* and convenient for the dentist?

Boiling or steaming.

94. What instruments require *Special Precautions*, and why?

Forceps, broaches, canal reamers, clamps, separators, and lancets, because they are used in or in close contact with the soft tissues, which are more readily susceptible to infection.

95. What is the best method of *Sterilizing the Mouth-Mirror*?

Either by the *immersion* or *vaporization method*, as boiling would injure most mirrors.

96. What is the best method of *Sterilizing Rubber Dam?*

Washing in hot water with an antiseptic soap, immersing in an antiseptic solution, and then thoroughly drying on a sterile napkin. Boiling produces deterioration of the rubber.

97. What is the best method of *Sterilizing the Hand-piece?*

Take it apart and cleanse it frequently, after which use the *vaporization* method; or boil the separate parts. In addition to this, frequently swab with alcohol the part grasped by the hand.

(*To be continued*)

EFFICIENCY*

BY JUSTIN D. TOWNER, D.D.S., MEMPHIS, TENN.

I PLEAD GUILTY to the accusation our President made this morning, when he said that many who contributed to our program either wrote their papers at the last minute or did not write them at all. I regret the necessity of having to offer an excuse, yet it is a fact I did not know the exact subject of my address until informed by my office several days ago. So if you will permit me to digress a bit from the strictly professional problems of the day, and speak more to the point of individual development, I will discuss that predominant quality which functions in every successful human activity—"Efficiency."

Some time ago I had the great privilege of being a pupil of Dr. A. F. Sheldon, author of "*The Science of Business*," and in the course, which was not completed in the brief time at my disposal, I absorbed more practical and useful information than ever before from any source in the same length of time. It was a revelation to find that this philosophy of "busy-ness" explained so many things which previously had been hazy in the minds of our best thinkers. I am here, then, to bring you a few thoughts upon "*Efficiency*" and in doing so will quote largely from Dr. Sheldon and endeaver to make some of the salient points clearer by using a few diagrams, which are either taken from his work or suggested by it.

We find ample evidence to justify the conclusion that men in every profession and vocation in life are too indifferent to their opportunities; too neglectful of their duties, obligations, and responsibilities. While in a state of indifference, man is dead to the higher principles of service, which alone justifies his existence, and blind to the ever-increasing demands for efficiency. Development of the constructive capacities, faculties, qualities and powers of the intellect, sensibilities, body and will, is the prime law upon which one must build in order ever to render satisfactory service or realize a worthy ideal.

That a rational idea may be gained of the fundamental principles of efficiency, as expressed in permanently satisfactory service, let us consider for a moment the primary requisites of Man Building, for upon the nourishment and use of these depends the constructive or destructive influence of our life. These principles pertain to the prime factor in all human relationships and as such directly concern you. The problem of development, then, is, first of all, a personal one. The object of each individual should be to develop a greater capacity to render satisfactory service, not solely because it is his greatest obligation in life, but because it is the only true way in which to protect his own rights. There is nothing truer or more basic than the fact that one gets out of life a reward in proportion to what he puts into it; therefore, the efficiency problem is purely a personal one and must begin with Man Building, the natural source of man-power.

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*A talk before the Tennessee State Dental Society, Sept. 1919

INTELLECT
SENSIBILITIES
BODY
WILL

Fig. 1

It is a fact in Nature, and not merely a personal opinion, that there are only four kinds of Man-power, the Intellect, the Sensibilities, the Body, and the Will. These four are all nature has allowed us, and are therefore ample material out of which to build a life of usefulness. The problem, then, resolves itself into that of how best to use these endowments in the art of constructing man-power. He who represents the best of all these four elements is one who has developed all sides of the square, as shown in *Fig. 1*, as nearly equal as possible.

If we develop the Intellect at the expense of the body, or physical being, the Will at the expense of the sensibilities, we disturb the square of our natural endowments and thus fail to wholly measure up to the requirements of efficiency.

In the progressive development of the four natural gifts of man, as shown in *Fig. 2*, by lines radiating from the supposed square, we have the intellect, which is the thinking faculty, developing into Intellectual Power, then into Capacity to Know, Discrimination, and finally Ability. The Sensibilities likewise are developed through four distinct stages into Emotive Power, Capacity to Feel, Ethical Conduct, and Reliability. Following the natural sequence we find that the proper nourishment and use of the body develop Physical Power, Capacity for Sustained Effort, Accuracy, and Endurance. Finally, the Will, which is really the

INTELLECT = Intellectual Power = Capacity to Know = Discrimination = ABILITY A
SENSIBILITIES = Emotive Power = Capacity to Feel = Ethical Conduct = RELIABILITY R
BODY = Physical Power = Capacity for Sustained Effort = Accuracy = ENDURANCE E
WILL = Volitional Power = Capacity to Do = Determination = ACTION A

Fig. 2

determining factor of all development, progresses into Volitional Power, Capacity to Do, Determination and Action.

For purposes of illustration we have focused each progressive line at the points of its most decided development, and following the diagram closely, find that intellect has developed into Ability, sensibilities into Reliability, body into Endurance, and will into Action. Taking the first letter of each word, representing the final square of attainments, we have a picture which shows the AREA of the individual. One's AREA is in reality his significance, or efficiency-value in the world of affairs. This may be broad, distinct, and well shaped, or it may be small, insignificant, and poorly defined. Given the perfect square of natural inheritance our AREA, which is the sum total of ability, reliability, endurance and action, is just what we choose to make it.

As a matter of fact our AREA is either constructive or destructive in proportion to how we nourish and use our intellect, sensibilities, body and will. We must either help make the world better through some constructive service, or destroy the uplifting influence of those who are really trying to justify their existence. It is essential that we develop our own lives constructively in order to build a better man and generate more man-power to overcome the destructive influences which constantly beset us. Constructive tendencies, or good intentions, alone do not amount to much, because it is only by correct nourishment and use that they develop and become a power for good. We accept, as a general truth, the assertion that "Nature, unaided, fails," and consider equally true the fact that some wise provision has been made whereby higher development may be attained. The provision must be that of nourishment and use, for it applies to all God's creation from man down. It is readily understood that if our bodies are poorly nourished and used, death soon will ensue. We forget, though, how equally important it is to apply this same rule to the development of the intellect, sensibilities, and will. The body, after all, is simply the temple of the Soul; the instrument which does its bidding and puts into practice what the Soul knows and feels and wills. It is not difficult then, to accept this law as a fact in Nature and agree with the statement that "Correct Nourishment plus Correct Use, as applied to man, equals Eduction." This is expressed in the equation $CN+CU=E$.

Having found the equation of man's efficiency to be that of Ability, Reliability, Endurance and Action, we are confronted with the problem of how this shall best be expressed. Action, so essential to the expression of the otherwise static powers, ability, reliability, and endurance, must take some definite form to make a progressive and constructive life. We conclude, then, that this action must be expressed in Service, and that one's AREA in reality denotes his service-rendering power.

In analyzing Service we find it composed of three distinct elements which make an equilateral triangle. The right kind of service must be of proper Quality, sufficient Quantity and right Mode. As seen in *Fig. 3*, the triangle, symbolizing service, is composed of three lines of equal length, two ascending representing Quality and Quantity respectively, and the base which represents the Mode. From this we derive the equation of Quality + Quantity + Mode = Service.

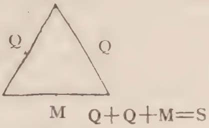


Fig. 3

This, then, is the measure of our efficiency which merits either reward or rebuke. If the three sides of our triangle are kept equal, commensurate reward is certain to follow, and always will be in natural proportion to the service rendered, whether we recognize it as such or not.

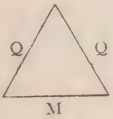
The law of compensation is a natural one and, being so, works with unerring exactness. No one can defeat or change Nature's law of compensation as aptly expressed:

> "The mills of God grind slowly,
> But they grind exceeding small;
> Though with patience He stand waiting,
> With exactness grinds He all."

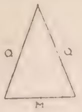
As we are rewarded in proportion to the service rendered, so are we penalized for any transgression of that unalterable law. We may as well expect to derive much heat from little fire as to reap great reward from little service. It can't be done because fire, the cause, is to heat, the effect, what service, the cause, is to reward, the effect. If we desire more heat we must induce more fire; likewise, if we want more reward we must render more service.

To further illustrate let us take four individuals, designating them as A. B. C. and D. A is a man whose work is entirely acceptable in Quality; his Quantity is all that could be expected, considering high quality; and his Mode, or method of rendering service, as well as his ethical conduct and habits of life, is in strict keeping with and equal to, the other sides of his triangle.

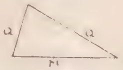
A's triangle is therefore equilateral as:



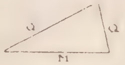
B is equally proficient in Quality and Quantity as A, but is deficient in Mode. He is not considerate of those whom he serves; he resents the progressive efforts of another who enters the same line of endeavor; and is irrational and dissipated in his private life. B's service symbol is this:



C is not up to standard in Quality, but is rapid in the execution and therefore long on Quantity. His Mode is correct save in the method of service which in turn detrimentally influences his Quality. C's QQM under these circumstances would be



D is satisfactory in Quality, but is slow and plodding and therefore short in Quantity. His Mode is correct in every particular, but fair dealing and lovable disposition can't overcome slow production; therefore his service-rendering power is deficient and is represented as:



We see from these explanations that A is the only one of the four, who, according to his QQM, renders satisfactory service and is therefore entitled to first consideration.

Let us now complete our illustration of the progressive development of man's natural endowments by focusing his AREA through the equilateral triangle lense of service, (QQM). We see from the diagram, *Fig. 4*, which is the completion of *Fig. 2*, that ability influences the quality of one's work; that reliability and endurance govern the quantity of it, while action is expressed through Mode. Our lines will meet at some point, and this must mean the worthy ideal of every one who desires to succeed. In fact the point to which all our progressive efforts lead is Success, "the progressive realization of a worthy ideal;" a fitting reward for every effort made to keep our lives in accord with the principles of service

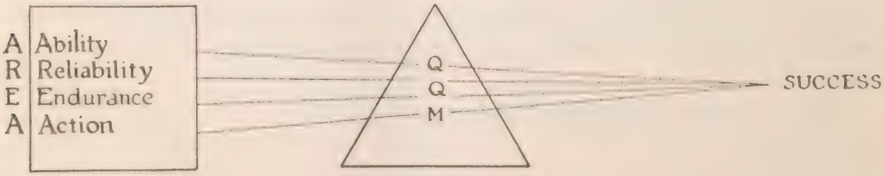


Fig. 4

We find on further analysis certain units of man-power, generally known as Attributes, which function through the four natural endowments, intellect, sensibilities, body and will. These attributes known as Capacities, Faculties, Qualities, and Powers are essential to proper development and therefore are necessary in the problem of determining real man-power. As Dr. Sheldon expresses it, "The power of the individual to render permanently satisfactory service increases in direct proportion to the development of the constructive capacities, faculties, qualities, and powers of his intellect, sensibilities, body and will." There never was a more definite or truer statement than this. In fact it is the true text of the whole problem of man building.

Attributes as we have shown, must be either intellectual, emotive, physical or volitional, and must of necessity be either constructive or destructive in direct proportion to their nourishment and use.

Capacity is the prerequisite of doing, and expresses the result of development of all our natural possessions, though in this connection it best describes the degree of intellectual attainment.

Faculty likewise refers to more than one endowment of man, but more especially the mental. Here it expresses mainly the ease in doing things for which one has talent.

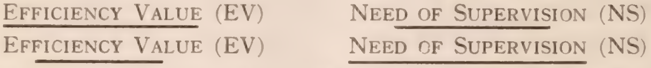
Quality is more a mental or moral attribute and is that characteristic which pronounces us good or bad. While it has a reference to, or qualifying influence upon the other endowments, it is used here with special reference to the sensibilities.

Power is descriptive of all endowments of man, yet is more closely related to the will, or volitional. It is in reality a mental attribute depending upon the will for expression, and as such is active rather than static.

Through the constructive development of the capacities and faculties of the intellect, the qualities of the sensibilities and faculties, qualities and powers of the physical being, we generate three powers which remain static until passed through the will and converted into action. Static powers, intellectual, emotive, and physical, denote ability to receive and store up, while the volitional represents the power to give. We see, then, that he who only receives is not normally developed; his life is static, to say the least. He must give freely of that which he has received in order to become a dynamic force, and make the world better for having lived. It is true, also, that one must give of that which he has in order to receive more, for it is a law of life that in order to receive one must give. This is just another example of the never failing reward which follows proper observance of the natural law of compensation. The majority of failures in life are due to keeping facts, or ideas, stored away rather than giving them out for the benefit of others.

The Supervision one needs in any given endeavor inversely affects his efficiency, and always must be considered in determining his value in any particular work. That this is a fact any one can prove who will simply observe and reason. You will rather unconsciously rate a man low in efficiency whose work needs a lot of supervision, and on the other hand naturally will consider one who does not need watching, very high in the scale of efficiency value. The degree of supervision which one needs depends upon the quality of his work, the quantity of it and his mode of conduct. In other words if his service symbol (QQM) is correct he needs no supervision and therefore has reached the maximum value; but if he is lacking in any one or more of these three elements he falls just that far short of being satisfactory. This fact is very aptly illustrated in the following diagram which shows that if one's efficiency-value line is long, the supervision line is correspondingly short.

The reverse also is true as illustrated:

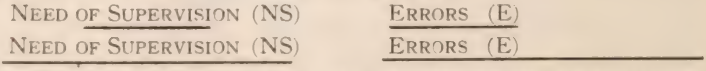


The first equation then, of our efficiency formula is: Efficiency value equals the individual plus or minus the need of supervision. It is expressed in the following:

$$EV = I + NS$$

Error is the one thing which makes supervision necessary and is the biggest little wrecker of life and business known. Nothing makes life more uncertain or business more insecure than this little murderer and thief. The man who simply lives from day to day without taking thought of how he may do better on the morrow, and is satisfied with a hand to mouth existence is in a rut, because his life is filled with errors of omission. It would be better even for this individual to commit errors in the attempt to do something worth while, rather than exercise no intitiative and fall a victim to the worst disease known to man—"the Ruts." If one has the courage to progress, his mistakes will more readily be excused. It is he who stands still that commits the unpardonable crime.

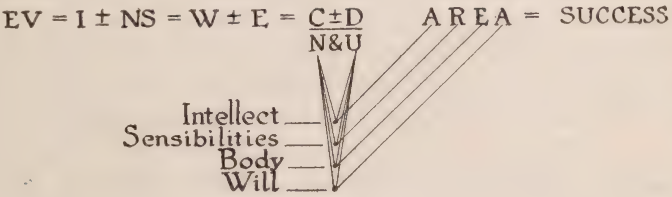
Unfortunately, errors of omission and commission, recognized as destructive attributes, are ever present and creep into our work in spite of every effort to avoid them. The best we can do is to so reduce them that our need of supervision will be slight. It is a fact which works with unerring exactness, and therefore a law, that one's need of supervision is in exact proportion to the number of errors he makes. We see then, as illustrated in the diagram, that if our need of supervision line is short, our error line is short, and that if our need of supervision line is long, our error line is of corresponding length.



In summing up the efficiency value of an individual, as finally expressed in success, we find the problem a simple one to explain, though not so easy of accomplishment. It is based upon one prime law and seven tributary laws, the proper observance of which is certain to mean "the progressive realization of a worthy ideal."

Giving serious thought to the prime or fundamental law, which says the efficiency value of an individual increases in direct proportion to the development of the constructive capacities, faculties, qualities and powers of his intellect, sensibilities, body and will, we find that this efficiency, *first*, varies inversely with the amount of supervision necessary; *second*, the need of supervision varies directly with errors present in work; *third*, errors are the result of destructive capacities, faculties, qualities and powers; *fourth*, these destructive attributes decrease in due proportion to their constructive development; *fifth*, the constructive attributes develop in direct proportion to their correct nourishment and use; *sixth*, AREA increases in direct proportion to the constructive development of intellect, sensibilities, body and will; *seventh*, success is directly dependent upon the development of AREA.

From this we see that the efficiency value (EV) of an individual (I) depends upon his need of supervision (NS) as expressed by work (W), plus or minus errors (E), which in turn is influenced by the nourishment (N) and use (U) of the constructive (C) or destructive (D) attributes of the intellect, sensibilities, body and will, and that upon the development of these depends his AREA, the determining factor in success. The Efficiency formula then would read:

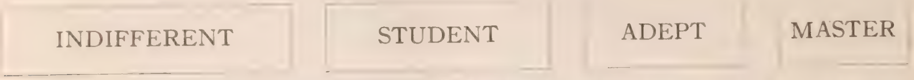


You will be surprised to know how few men really succeed. We have it on authority, though the exact figures are not available, that less than five per cent. of all men in any given endeavor succeed. This means, of course, that at least ninety-five out of every hundred men—dentists, physicians, surgeons, lawyers, preachers, etc., fail. With respect to the purely financial success, which is of some concern to the dentist as a human being, I submit the following figures compiled by an insurance company and quoted in *Science of Business*. This data has been worked out according to the law of average and therefore is correct:

Given one hundred healthy men twenty-five years of age, we find that at age of sixty-five, fifty-four are dependent upon charity; thirty-six dead; five earning a living; four are wealthy and one is rich. These are facts, at least they were when published, and the sooner we accept them as such and try to improve the percentage of successes the more apt we will be to avoid being classed among those who fail.

Statistics are available to show the percentage of failures in any given profession or business, but those just quoted will serve to impress the absolute importance of more constructive development to the end of increased efficiency.

From the standpoint of success, as expressed through efficiency, there are four classes of individuals in every vocation: The Indifferent, the Student, the Adept, the Master. The illustration shows their relative percentages.



Indifference to success means lack of development for greater efficiency and the neglect of even the simpler means of improving our ability to do. We are too apt to waste our time on non-essentials rather than consider seriously the problem of how to win life's best rewards—success and happiness. We must be sober minded and not take our life-work as a joke, because it is really a serious matter though not necessarily a solemn one.

The student is constantly on the alert for useful knowledge and gradually becomes proficient in its application to his chosen work. As his ability to do things increases he finally becomes an Adept, or artist.

An Adept is one who can do the right thing, at the right time, in the right way more than once; and as this correct procedure becomes a habit he develops into a Master. A Master, then, is one who can be depended upon—the right man to do the right thing, at the right time, in the right way, and no man ever became a Master who failed to make the necessary, intelligent, serious, and persistent effort. The reason why there are so few Masters and ninety-five per cent. failures, is that we do not properly develop our natural endowments. This is borne out in a statement by the late Professor James, of Harvard, to the effect that the average person develops less than ten per cent. of brain power and not more than thirty per cent. of possible physical efficiency.

G. E. Harter, (Toledo, Ohio). I have had the pleasure of listening to two very interesting papers, and about all I care to say in the short time assigned me will be in the line of discussion of those two papers.

The first essay, in which Dr. Phillips spoke of ideals, brought to my mind a concretion, or summing-up, of the contrasting ideals of the professional man, and of the mercantile or commercial man.

The ideal of the professional man is, or ought to be—I may say it is, because when that ideal fades from his mind he has ceased to be a professional man, and becomes a commercial agent, either for himself or somebody else—the professional ideal is to give as much as you can for what you get; the commercial ideal is to get all you can for as little as you can give and "get by."

Now, I believe I have made these contrasting ideals plain. I hope you have understood them. If the ideal upon which you are seeking to build and hold a practice is to obtain as much as possible for as little service as possible, you are not a professional man, no matter what title you write after your name, and you have become a commercial man, no matter under what sheepskin you practice.

Dr. Towner, in delivering by all means the most interesting psychological address to which I ever have listened, made the statement that no matter whether you believe it or not, you and every other man gets precisely what he earns; that reward comes in precise proportion to earnings. Not only the reward, but the time, the measure, the method, the quality of that reward, depend absolutely upon what you are and do. Of course, you cannot carry a proposition of that kind very far without arriving at the necessity for accepting a succession of lives of activity somewhere, somehow; nor, if you believe that effects follow causes adequately, can you very long keep away from the idea that we live successive lives right here.

However, we need not go into that phase now. I only mentioned it as one of the conclusions that is sure to grow out of any serious consideration of these subjects. Dr. Towner said that if he had somebody here who could quote Scripture for him, he would back up his argument from that source. I will quote a couple of extracts. Paul said: "Brethren, be not deceived; God is not mocked." ("You cannot fool the absolute," is another way of saying the same thing.) "As a man soweth, so shall he also reap." That is as sure as life and breath: "*as* a man soweth, *so* shall he also reap."

Now, Dr. Towner likes to branch out and bring things in under an equation, and so do I. There are a good many things that have to do with sowing; there is a good deal in *what* we sow, and in *when* and *where* we sow it; and I hold that we must necessarily reap under related conditions to those under which we sow. If you sow turnips in the back yard, and wheat out in the field, you don't go to the wheat field to reap turnips; you go to one field to reap what you have sown there, and you go to another field to reap what you have sown there.

I want to give you something that will apply on another thing Dr. Towner mentioned. It is this: I knew, for a good many years, Dr. J. D. Buck. He was Dean of the Medical Faculty of a Medical College at Cincinnati for forty years. I knew him for twenty-five years, knew him intimately, knew him well; had a great many long, intimate conversations with him. You may know that the physician, at graduation, is called upon to subscribe to what is called the Hypocratic oath, the oath of Hypocrates, an oath to use the knowledge which has been entrusted to him, handed to him for a while, for the benefit of humanity, regardless of position of the recipient or any other condition whatever. Dr. Buck said that in all of his experience as the head of the medical college, he never had known one single case of the success of a practitioner who signed that oath "with the point of his pen" only, who proceeded thereafter to use that knowledge for the benefit of himself, large fees being his main object—the commercial idea only—who did not end in disastrous failure somewhere along the line. He said you may point to a man in middle life as a startling example of the untruth of that proposition; but wait until he finishes. There is something radically and fundamentally wrong with the character of a man who will do that sort of thing.

Let me let you into a little psychological secret: A man physically becomes just what he is in character. Character comes first, then mind, then body. Man builds his body. Every faculty that a man has he has built, because man is not a physical being functioning psychologically, but he is a psychological being functioning physically. Do not forget that. Man, first of all, is character; then he gradually develops down, down and down, until he produces this physical body which he uses and works through. Man does not think *with* his brain; man does not act *with* his body; man thinks *through* his brain, and acts *through* his body. The body is nothing but the tool, the last, outermost, grossest, heaviest, least useful tool the man has. The intellect, also, is the tool of man; mind is the tool of the will. You think not? I once asked a great psychological lecturer who came to Toledo to lecture on such a subject, whether he recognized any difference between the man and the mind and the self. He said he did not. I said, "My dear man, don't you know that it is possible for *you* to concentrate your whole mind upon a subject at your will, and to split your mind and function in two different ways through the body at the same time? Don't you know the mind is completely under your control? The mind does not control you; if you put it in its place you can make it do anything you choose to do." So much for that.

Now what I wanted to say applies to everything that has been said today. Possibly we may say it makes a practical application of it.

Now, please understand that to me it is not what man gets out of the world that marks him as the man, but what he puts into it. "Seek ye first, however, the Kingdom of God, and His right living, and all these things shall be added unto you." I do not mean that in a theological sense at all. What is the Kingdom of God and right living? The ethical consideration, the placing of another man's rights not only equal to yours, but far beyond them. If we think of these things at all very long we will understand that the only real good comes to us through giving, not getting. Ella Wheeler Wilcox says: "Give unto the world the best you have, the best will come back to you." And I want to tell you another secret: If you give the world the best you have without calculating returns, you will get the best the world has to give. The fatal mistake is in the foundation or bed rock of Character. Many men *do, in order* that they may *get.* That is what is the matter with most religions that teach goodness as a means of getting something good, in order that some reward may come to us because we are "good." You must be right and do right as you see it, for right's sake. You must be a professional man because it is *professional;* because that is what you have pledged yourself to be; and you can forget the reward, you need not think anything about it. Put into the world the best you have, and kiss it goodbye; cast your bread upon the waters, without a hook in it, or a string to it, and it will come back to you every time, no matter how you may seem to be to the world. This question of ethical living toward the world is far more important than that of the ethics you owe to one another; and no matter what you *seem* to be; only what you *really are* really matters; because the Universe judges men by their hearts, and not by their faces, not by signs on their buildings.

Now, since I have known the dental profession I have regarded it as not only one of the highest professions, but the highest; the one of greatest opportunity for good. I have sat in dental conventions and have been surprised to hear members plead with each other that they so conduct themselves as to be regarded as a branch of the medical profession, and to demand recognition from the medical profession. Why, if I were a dentist, I would say to the medical profession, "Come in, make yourselves one of us." I have known many members of the medical profession well and intimately; and all the best of them can do is to kick obstacles out of the way; that is all. What can dentistry do? If the practice of dentistry is properly pursued, if you do what you can do, dentistry will prevent the *formation* of obstacles. Then the medical profession will not have to be called in to kick away the obstacle, because the obstacle will not be there.

I once heard a noted cancer specialist in New York say: "If you dentists would do what you ought to do, there need never a patient die of cancer. If you know the physiology and a little bacteriology, you can detect cancer formation in the mouth *eight years* before it reaches the operative stage. When that stage is reached, what happens? *First*, we cut; in a few months we cut again, and that is about the end of it. When they reach the surgeon, and once go under the surgeon's knife, it is too late to do much with the cancer. But the germs of cancer may be detected in the grindings of the teeth, in plaques, in caries, and they may be removed by prophylactic treatment of the mouth of the patient."

Why, you people have not scratched the ground of your profession; you have not touched it; you are only beginning to realize that there is something for you to do. Do you know what the great Dr. Mayo said—that the next step in preventive medicine must come from the dentist?

The mystery is, that mankind should be so perverse in certain things. For three or four hundred years we have been burrowing around down in the abdominal region to find the signs and causes of diseases, when the first three inches of alimentary canal, right in front of us, right here in the mouth, contains indications of ninety-five per cent. of them. We do not like to see the things that are obvious. If we did, we would all be philosophers. We like to bore into the mysterious things; we like to shut our eyes to the obvious and take a grab; the perfectly obvious things we avoid. One reason is this: We have been taught from the beginning that there are certain mysteries that no man can find out, and we don't try, or haven't tried earnestly enough. I want to say to you that to me the only mystery in the Universe is that some people think that there are mysteries that cannot be unravelled. Every mystery can be unravelled if we take time, patience, earnestness.

Rev. Frank Gunsaulus, of Chicago, stood in a pulpit in Toledo, and told his audience that the will of man was absolutely infinite in its scope and power. I believe it.

Now for a practical application of all of these things: Too much, too wide, too diverse and too deep an education is impossible to any man, particularly to the dentist. But very little of such education can be obtained in the colleges. The place to get your education, gentlemen, is the world; in the affairs of men, all about you.

Now, then, how are we going to increase our efficiency? How is a man going to do all of these things about which Dr. Towner has told us very ably and very interestingly? Each must begin by developing himself. Stuffing is not education. The word "*educio*" means to draw out, not to put in. Do not get the idea that the schools have had for a great many years, that you can put a funnel into the top of a boy's head and fill the mind as if it were a sponge.

Who was that who said: "Knowledge dwells in minds replete with thoughts of other men; wisdom in those intent upon their own"?

All education should have for its purpose simply the development, which means the unfoldment, of the man inside, the *real* self, with all of his powers. No man ever thought too much. Minds never wear out, but they rust out! You cannot think too much.

By confining yourself and your thoughts to one set of things, you cultivate in the brain precisely the thing that your wagons cultivate when they run out here on the country roads, when they go over the same space all the time—you cultivate ruts. I have not the time to go into the psychological or cranial development at all, except to say, that ruts wear out people the same as the wagons wear out the roads. You plough deeper and deeper the ruts through your brain, to the exclusion of other areas or convolutions that ought to be developed; so that you soon are able to express through your brain only certain kinds of thoughts. As Dr. Towner told you, it does not make any difference how much you know; it doesn't make any difference how much you feel; it doesn't make any difference how much you have; it is what you *do*, what you express, that counts. I don't care what a man has. It is of course an old saying, and true, that the world pays pence for labor; but the world pays many dollars for thoughts plus labor. Most people only think they think. Thomas Carlyle says, "The greatest event in the world is the birth of a thinker into it." Think of a man who thinks something that was never thought before! Of course there is a great strata of thought and of thoughts buzzing all the time throughout the world. Everybody believes his thought is original; but it may not be; some one else may have thought that thought, but he gets it and uses it, and maybe carries it out into action.

All knowledge comes through attention, gentlemen. Carlyle says that attention is "a stretching toward," a mighty good definition.

Now I want to tell you how some men have educated themselves.

Lord Kitchener, the war-lord of England, is said to have developed a means by which he kept himself young and efficient to the last minute of his life. He left his bed in the morning, and, closing his eyes, went to his bath-room, took his bath, got out his razor, honed and stropped it, lathered his face and shaved, cleaned and put away his razor, went back to his bed-room, got his clothing out of the drawers, and put it on, with his eyes shut, solely by the sense of touch.

You cannot keep *any* sense alive like that without keeping every sense alive. He also practiced this: He would lay his watch down on the table, and step away from it until he could barely hear it tick; then he would turn the other ear to it; then he would notice if the ears were balanced; if they were not, he would work on the weak one; then move the watch farther away, and so on, and so on, until he could hear it nineteen or twenty feet away. He would then have some one else place that watch somewhere in the room and walk to it blindfold and put his hand directly down upon it. He was not satisfied to grope around and put his fingers on it just any way; he wanted to put his hand down on it firmly and decidedly at the first attempt. If that is not a practical application of psychological facts, I do not know any.

You must develop all over, if you want to be an educated man; you must be able to see right *into* things; we want to put teeth into the mind of man, so that he can bite right down into the hearts of things, and not take surface indications for conclusions. The trouble with a great many people is that they take things as they seem to be; to them a tree is simply a tree, a rock is a rock; they have never thought enough to know that nothing is solid; that atoms never touch each other. No gold is so fine that any one atom touches any other atom; you cannot roll gold so fine that you can make any two atoms touch each other.

Dr. Towner told you that the intellect has the power to arrange and classify facts. Yes; but it has not the power to discover *one* fact; the intellect never made a single discovery in all the world; there is something else, there is another faculty; when the mind developed the intellect there were plenty of other faculties left. I recommend that you read something that is hard for you, something that you have got to "stretch toward." Read that until you understand it; then you will see how simple other things appear. You really should not be content with a smattering, but get down into things. This is mental exercise for development.

Now, in order that my interest may be aroused, I must have a result to work for; therefore I do not like golf; I do not like any of those mere motions of things; I like gardening, because there is something that I can see grow; I want to produce something; you must have something you are interested in to develop yourself physically; you may rust out, but you will never wear out by working. You know what Gladstone did, of course? He chopped down trees every day of his life. Of course he did not care anything about the fuel; it was something to do. This is physical exercise, also for development, and to rest the brain and nerve centers.

I am less interested in the fees that you earn than in what you do with your money after you earn it; nevertheless there are some things that I have been able to suggest to a good many dentists that they have found to their advantage.

Now, take the matter of fees. There is no such thing possible as a level fee. If you are a professional man, you are not selling material to which you have added some little value by your work.

The first dental convention I attended was at Goshen, Indiana. There were two or three dentists behind me on the train, talking away about some other dentist, and they said that he was a "fine workman." What would a surgeon have said? "A beautiful operator." Never think of yourself as a workman; you are an operator; you are a professional man. When I think of a workman, I think of some one grasping a hammer, like that; when I think of a professional man, a dentist, or a surgeon, I think of a man holding an instrument delicately poised, going down into a cavity or incision with delicacy and precision, like no such thing as a workman with a hammer.

You may say that there is or should be a level fee for equal service; there is no such a thing as equal service. You can not say in advance that you can put on a crown for six dollars or for sixty dollars. You don't know anything about it; you are performing a surgical operation; you are restoring something.

There is one thing that precludes the idea of the level fee, if nothing else, and that is the standing of your patients financially in the community. A man who earns one hundred dollars a week is worth ten times as much as the man who earns ten dollars a week, pecuniarily; he may not be worth more morally, of course. The man who earns ten dollars a week may be worth much more morally than the man who earns one hundred dollars; but we are not talking about that now; we are talking about the financial worth, that is, the money side. Now the man who earns one hundred dollars a week does not expect to be let off with the same fee that the man who earns ten dollars a week is asked to pay. When a noted millionaire died, and his executor refused to pay an account of his dentist, who presented a bill for fifteen thousand dollars, the judge decided it was not an excessive fee, exactly on this basis, on the basis of the wealth of the estate, and its value financially to the community. In that case fifteen thousand dollars was not an excessive charge. The dentist got his money. In a city near Toledo, there are three men whom I know well, who have formed a combination practice; one is the prosthetic man, one the crown and bridge man, and the other the extractor, and they employ others. It is not at all unusual for those men to get twenty-five hundred dollars for a pair of plates. They are absolutely right; they please the patient, and the patient tells them they are cheap at the price. Of course, they do not appeal to people who cannot pay the prices, but they appeal to the people who appreciate satisfaction, and they do get it, without any trouble at all. The Mayo Brothers base their fees entirely upon the ability of the man to pay. You cannot begin to get those men to tell you what your operation is going to cost until they have had time to find out what your income is, independently of anything you may be willing to tell them. The richer a man is the less frank he usually is about his income. The Mayo Brothers tell you that they will diagnose your case, when you come there, but in the meantime they are diagnosing you financially, and when you get through with it you get a bill that is right. I know of one man who sent them a fee of twenty-five hundred dollars for an operation on his daughter; they sent it back and told him it was too much, and charged him five hundred. I know of another man who sent them a check for five thousand dollars; they sent it back and told him his fee was fifteen thousand dollars.

This is possibly a secret: Surgeons, I am told, (this may not apply anywhere but in the city of Toledo) aim to get one month's income for what they consider a major operation, one month's income is what they attempt to get if they can find out what that is. Again, there can be no such thing as a level fee; there can be no such thing as a price named in advance for such things, because you know nothing about what you are going to find when you get into a cavity. What about the pretreatment, and that to prevent sepsis, that ought to follow operation?

Understand, fundamentally, lying down underneath all this, I believe that if you do your *whole duty* you will get fees enough; you don't need to think about fees at all.

I have found malpractice in the dental profession—malpractice toward the dentist himself. A dentist once came to me, and said: "I don't think I can make a living putting in amalgam fillings for one dollar." I said: "Of course not; give your best service, charge a proper fee, and render the statements accordingly." He said: "My patients will never stand it; what will I do?" I said You can do it if you feel that you are rendering proper service. Keep that in your mind. That is all there is to it. It has not been so many days since that dentist told me that he had not had to explain two bills in a year.

Materials are no basis for charge, not the slightest. You should diagnose the case and use the material indicated, and you should not ask the patient what he wants you to do. If my dentist found some conditions in my mouth that he didn't know anything about, and asked me what I wanted him to do, I would put on my hat and walk out; I wouldn't have anything more to do with him. Suppose I should go to a surgeon, and ask him to saw off my leg? Would he do it? Not much! Suppose I went to a doctor, and asked him to prescribe certain things for me; would he do it? Never in the world; he wouldn't any more do it than he would fly. Suppose you put your patient down in your chair; suppose you cannot make your diagnosis. If you find that you should use the X-ray, do it, but that is only a step. I went all the way to Chicago to hear Dr. Logan deliver a lecture on the fallacy of the X-ray diagnosis; there is no fallacy about it except that it is not infallible. It is almost impossible to make a film that will not exaggerate one or another phase of an abscess; you cannot decide anything positive about it. I have been told and shown that restored granulation around the root at the base of the teeth appears about the same as an abscess on the film. You must have something else besides that; you must have palpation, or something of that kind, to decide whether it is an abscess or not. There is another new thing coming in, the stereopticon radiograph, that is another step in advance. You get two views at once; that is a good thing that will come along after a while.

I don't want you to pay any attention to what the patient thinks he wants, unless it is a mere matter of esthetics—appearances. If a patient needs a crown on a front tooth, you might ask him if he prefers enamel or porcelain or gold.

One other thing about materials. If you went to a physician, and suppose he was dispensing his own medicine, if he gave you a half dozen powders of sugar of milk, would he charge you any more or less than if he gave you the most expensive medicine he had? Not at all. He never thinks of the material, he doesn't pay any attention to that. If you take two simple prescriptions to a druggist to have them filled, he will charge you seventy-five cents to two dollars each, depending on his reputation, no matter how little the materials cost.

You are rendering service, you are not working for wages. You may think that I have destroyed every standard of value that should be considered. Not much! There is but one standard of value—your service to your patient. What have you done to your patient? You are not selling him gold; you are not selling him amalgam; you are not selling him anything; you are giving him your time, you are giving him *service.*

You may think these things are all nonsense. I have seen these things worked out, and have learned that men have built up splendid practices by getting into the new attitude of the profession. That is what I want you to do. You are the ones to decide what your fees ought to be. If a man is worth a lot to the community, charge him a commensurate fee; if you want to do charity work, do it, and render to the man that cannot pay you one cent just as good and faithful service as to the man that can pay you a large fee. I thank you.

DISCUSSION

President Rich: Dr. J. L. Austin will open the discussion on these two papers on Efficiency.

Dr. J. L. Austin, Chattanooga: Mr. Chairman, I have enjoyed these two papers very much. Take Dr. Towner's paper on psychology: I think it is one of the best things I ever heard. I don't feel like saying much about it, because I don't know much about it. I started at one end. I remember very well the equilateral triangle and Service for the foundation, and I was memorizing those things, and expected, when I got up to open the discussion, to have a lot of stuff; but about the time I imagined I had everything down pat, he erased it, and he ruined my foundation. So I got balled up on the thing and I haven't much to say; because, as I see it, and the point Dr. Towner is driving at, and the common-sense views that I have of it, it is our duty to make ourselves efficient; and I am glad they both stressed the point of efficiency for the remuneration instead of how much money you can get for certain things. I believe as much as I believe anything, that any man will succeed if he starts out rendering efficient service. I don't care anything about who the fellow is, how much handicapped he is, I believe if he renders the service—if he casts his bread upon the water without any hook in it, he will reap accordingly. And I believe a man's success in the community in which he is located depends absolutely on the opinion the people have of his conscientious efficiency in his service. And I do not believe a man will succeed all through life—he may succeed for a few years, but he won't succeed all through life, if he don't at least try to give as much or more than he tries to take. I doubt very much if a man ever gets pay for the very best dental service that he can render any man; I doubt very much if he ever gets as much as that dental service is worth to the patient, I don't care what it is; but he should make it a rule never to take more for any piece of work than it is worth to his patient. In other words, don't do a service because there is money in it. I believe there have been a great many gold crowns and restorations made of gold because it was easier to get money out of gold than amalgam. Gentlemen, I think, instead of studying about the volume of business and how to get business, the thing to do when you get a patient is how to do the most for your patient that you can. Don't worry about trying to get business; don't go to church to get business, and don't try to get the biggest church in town. If you are a young man, go to church if you want to, but don't try to work for patients at Sunday School. The only way to work for a patient is when you are working for some man, try to do your work so satisfactorily that when he leaves he will send some one in his place.

President Rich: The subject is now open for further discussion. I would like to hear from some one else.

Dr. J. P. Corley: Mr. Chairman, I hope the Tennessee Dental Association will not let go unchallenged the statement on this floor that dentistry is a more important asset to society than medicine. For God's sake let's not go on record as being such assinine, egotistic idiots. We don't believe it, and the man who said it don't believe it, unless he is a bigger fool than he looks.

Dr. Byington: Here is a fact which we must all realize and appreciate as a fact—that psychology or the predominating mind is the impression that you must convey to the individual that comes to your office, or, in other words, you must be absolutely ready to place a "homely" cap on the situation. A patient goes into an office and gains an impression immediately. If the patient is not acquainted with you, he gains the impression immediately of you by the manner in which you go about your duties, the operation or otherwise, the manner in which you present yourself; in other words, gets immediately a mental picture of the situation; he is either favorably or unfavorably impressed with you. That is nothing more than psychology.

We know that the first impression is gained when patients enter the office. You go down here, as an illustration, to a clothing store, we will say, or a restaurant; you go into a restaurant, where they have a fine orchestra, and every waiter standing at the table at attention; you know that you are going to pay more for that meal; and it is worth more than if you go down here to some little Italian restaurant where a fly swatter is served with every meal; you know that. That is nothing else under the sun but psychology. You go into this fashionable restaurant, you are paying more, and it is worth more; you are seeking more. The last speaker brought out the fact that there is not very much in luck. The revised way of spelling "luck" is with a "P"—P-l-u-c-k. And I think that will be borne out throughout the undertakings of you all.

He says patients are not lost by fees. I think that is true. I don't think many patients are driven away from the office as the result of the fee. You can all probably look back, as I can on my own practice, years ago, when probably I charged a dollar for a filling and what we called a cleaning.

Dr. Phillips: You threw that in?

Dr. Byington: Yes, I threw that in sometimes, but anyway the patient paid too much for it, absolutely. The fellow who pays fifty cents for what is advertised as a filling is paying too much for it. It is advertised at a bargain. The same applies to us as individuals today. He cannot pay too much if we render proper service. That brings the thought that we should not strive absolutely for money. Our distinguishing mark should not be money, but merit.

Here is something, too, a notation I made on Dr. Thompson's paper: "The application of thoughts pertaining to dental journals and everything that will have a tendency to broaden the scope and views and make you well-rounded men." I think that is specially fitting and fine that Dr. Thompson should have brought it out in this society. We have in the neighborhood of thirty young men that have joined this year. You will notice the societies today are almost all young men. There is no question in my mind that the young man that becomes the first year or two indifferent to attending societies and thinks that he has got it all in school, he is retrograding rather than progressing. And I think it is mighty fine that these young men are here and have gotten such a fine utterance from Dr. Thompson here that may be emphasized and followed up. Something else and I am through. Further, the psychology, the mental impression, not only the mental impression they gain when they enter the office, but the general environment, the appearance of the assistants, the maids, the general equipment of the office, your personal appearance, the manner in which you approach them, and the spotless operating clothes and all those things, they all go in to make that mental picture which is absolutely important and essential. With that I might say that a fitting finish to it is an individual that is ever radiating a smile, like Dr. Bogle over there, a smile that won't wear off. If you go to a dentist that is a little bit grouchy, he never has anything to say, but it is, "Come back Thursday, two weeks," or otherwise, it means a great deal. The fellow that is radiating a smile, the fellow that is happy, the fellow that has a good warm handshake, they might say he is a rotten dentist but he is a fine fellow, let's stay with him. That is a personal asset that goes along with the psychology as Dr. Thompson says; these things all go to make up what we should estimate in our own minds a well-fitted and well-rounded dentist. I thank you.

PRESIDENT RICH: I would like to hear some further discussions. The discussions become very interesting. If there is no further discussion of this subject, we will ask the two gentlemen who first spoke on the subject to close the subject. Dr. Towner first.

DR. J. D. TOWNER: I have appreciated the discussion of the few remarks I made, especially the remarks that Mr. Harter had virtually already prepared for his talk, which coincided exactly with the principle that I had in mind and tried feebly to express and impress.

I have nothing to say in closing, except to finish the definition, which I neglected to do, feeling that I already had occupied too much time, and that definition, finished, as exemplified by the paper and the discussion and the drawings, would be this: One's efficiency value, or his ability to render permanently satisfactory service is in proportion to the development of the constructive capacities, faculties, qualities and powers of the intellect, sensibilities, body and will.

Now, if you get that definition, gentlemen, in mind, and know that all of your efforts at improvement in efficiency must revolve around the principles stated in this definition, you will simplify for all time the equation of efficiency functioning in success, which has reward as its effect. I thank you. (Applause)

PRESIDENT RICH: Mr. Harter.

MR. HARTER: I have only a word or two to say in reply. My experience with the medical and dental professions has been such that I would give a great deal more for dental service than medical. There is a man in Toledo to whom I go every few years for a thorough examination. He goes through me thoroughly. He will say, "there is nothing the matter with you. Go to the dentist." I go there anyhow every few months, when I get a little bit "off." I often go to this medical man, and he says, "I could fill you up with medicine and kick you over the bars, but I won't; you know what to do. Go home and do it." Now, I am judging from my own viewpoint, and I do not ask anybody to accept my view. Therefore, the criticism seems to be out of order. I don't ask you people to go on record as accepting anything. I give it as my opinion. It is not based upon any fly-by-night opinion that just came into my mind. It is based upon my experience. If I had to do without one or the other—the dental man or the ordinary medical practitioner, I would far prefer to do without the medical man than the dentist. (Applause).

DISEASES OF THE MAXILLARY SINUS*

BY B. H. JOHNSON, D.D.S., NASHVILLE, TENN.

THERE HAS BEEN much agitation, national and international, urging nations, states, communities, professions, trades and individuals to do their part to win the war. We are proud that our profession had progressed and was a recognized necessity and more than made good. Now that the Germans are whipped, we can rally our forces against the Germs. To do that successfully, we must know their fortifications, their plans and actions, and be able to recognize their presence.

According to Blair, the maxillary sinus is a very important fortification for germs. He says: "Although the antrum may be the seat of numerous surgical diseases, infection followed by suppuration due primarily to pus organisms, or secondarily to some one of the exanthemata or la grippe, is so common as to overshadow in importance all other lesions combined."

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*Tennessee State Dental Society, Sept., 1919.

Recognizing the fact we, as dentists, should do our part along with the rhinologist, the general surgeon and physician, with the aid, when necessary, of the bacteriologist.

To do this with any degree of efficiency, we must be familiar with the anatomy, function and construction of the maxillary bone and adjacent structures when in a healthy condition; so, if you will not consider it a reflection on your knowledge of anatomy, we will review a little. The superior maxillary is the largest of the facial bones, helps to form the roof of the oral cavity, partly forms the lateral walls of the nose, and the floor of the orbit. It consists of a body and four processes. The lateral process, or zygoma, connects with the malar bone. The palatine process extends in a medial direction and constitutes, with its opposite fellow, the largest part of the hard palate. The lower border of the maxilla is the alveolar process, above and anterior lies the frontal process, which joins the nasal frontal and lachrymal bones. The body being hollow forms the maxillary sinus, which is connected with the middle meatus of the nose by an aperture high up in the inner wall called the maxillary hiatus. Sometimes there are accessory openings.

The sinus is lined with ciliated epithelium, which carries the mucous secretions upward and outward through the nasal opening. Normally this cavity only contains this ciliated epithelium, its secretions and air. It is a sounding box for the voice, and varies in size in different individuals, and often the sinuses will be very much different in size and shape in the same individual.

It seems that we have been slow to recognize that the maxillary sinus is in the field of dentistry. Of course when the infection of the sinus is secondary to a nasal infection, or which requires intra-nasal surgical treatment, then it should be done by a rhinologist; but, if it is infected from an abscessed tooth or infiltration through the floor of the sinus from oral lesions or infections, or even if infected from nasal cavity and allowed to remain a sufficient time to disease the floor and destroy the vitality of the structure supporting the teeth in that region, then the dentist should handle the case; and we often have cases sent to us by the rhinologists, because they recognize the fact that no matter how much intra-nasal drainage they establish, until the diseased bone is removed, intra-nasal treatment will not give satisfactory or permanent relief. Therefore, we should be able and prepared to cooperate with the rhinologist both in the diagnosing and treatment of this sinus.

Quoting from Blair—some subjective symptoms: As in any acute pus infection, there may be fever, leucocytosis, and an increased percentage of polymorphonuclear cells in the blood. These symptoms are especially likely to occur if the pus is confined by obstruction of the natural opening. With confined pus the most characteristic and constant subjective symptoms are pain and tenderness. The pain may be local or occur in the guise of a headache or referred neuralgia. This is to be distinguished from headache resulting from eye strain in that it is not relieved by resting the eyes. Headache is a symptom common to suppuration of any of the sinuses, as is an irritation, neuralgia of the face running down the neck and arm and to the back of the head, but pain, tenderness or a full feeling over the sinus is more apt to indicate a local trouble. According to Ballenger, giddiness and vertigo or a momentary sense of blurred or darkened vision and fainting frequently are present in sinus disease. Patient may see spots.

These symptoms may be made worse or produced by stooping over. However, there are many cases of badly-diseased sinuses where none of these symptoms have been noticed. For example, a man past fifty years of age who had suffered for over eight years with rheumatism in the hip, during this time never had been free from pain except temporarily with opiates, often putting him in bed and in a very helpless condition, was at last during a severe spell given up by his and consulting physicians as a hopeless case, but as last resort had his teeth X-rayed, although he claimed that he never remembered having an ache or pain of any kind from his teeth or jaws. No pyorrhea nor even gingivitis was present, teeth looked sound, no crowns or bridges, nor as I remember any large fillings. But X-rays showed not only the destruction of bone and process at the floor of the antrums, but to and including the median line from both sides, one side the maxillary hiatus being entirely closed. After operation he has been entirely relieved from his rheumatism, says he feels like a boy again. Have seen several other advanced cases that gave no history of pain in region of the maxillary sinus.

The objective symptoms are both intra-nasal and extra-nasal. The intra-nasal symptoms may be in the form of an irregular discharge of fluid or pus coming in gushes, or the presence of pus under the center of the middle turbinated bone. Suppuration of the nasal mucous membrane is rare, and presence of pus in the nose is generally a certain sign of either an infected or suppurating maxillary or frontal or anterior ethmoidal sinus if discharging under the middle turbinate bone, but if above the middle turbinate bone would be from the middle or posterior ethmoidal cells or sphenoidal sinus. A gush from the nose, brought on by having the patient bend forward, is very suggestive of fluid coming from the antrum, but also may be from the sphenoidal sinus. Of course if the maxillary hiatus is closed, we will have no antral discharge from the nose, but may be a bulging into the middle meatus. In some instances maybe a bulging or rupture into the orbit with exophthalmas. Pus may burrow and perforate the palate or even the thicker anterior wall. May detect fluid in antrum by placing an electric light in the mouth in a dark room, the light is transmitted through a normal antrum and shows on the front of the cheek and lower eyelid, shows a red crescent of light over lower lid and shows real pupillary reflex. Patient will be conscious of the light with eyes closed, latter being of course a subjective phenomenon. When fluid is present, there is a lessening of the red pupillary reflex and of the crescent light over the lower lid. The light over the cheek may be misleading as one antral wall may be thicker than the other. Fluid or a growth in the sinus will obstruct the X-ray, causing a shadow, also a blurred outline of the sinus. But it usually takes several or at least two or three radiographs from different positions to make a diagnosis by X-ray and then be governed by clinical findings. Some advocate verifying diagnosis by puncturing the antrum, under local anesthesia, either through the nasal wall under the inferior turbinate bone, or through socket of an extracted tooth, or through the canine fossa. Owing to the very close proximity of this sinus to the upper posterior teeth, and in many instances the sockets of these teeth protrude into the antrum, it is very risky to devitalize these teeth or treat putrescent pulps, because where radiographs show such thin floors, and these teeth do abscess and erupt into the sinus, the abscess causes no pressure, therefore no warning pain, and often serious complications in the form of focal infection, or even a secondary foci of infection may occur, then the removal or clearing up of the primary infection may not relieve the patient. Therefore, we should strive for prevention along this line as well as all others.

It is so easy for them to become chronic; in fact, they are nearly always chronic before we recognize them; then we are inclined to wait for further development to be more certain of our diagnosis. I recall one case that because the face illuminated clear, I waited several months with an occasional examination, finally operating and when sinuses were opened the gases perfumed the whole office; very little pus, but lots of gas. I was sorry I had put it off, so was the patient; said she could have been feeling better all that time.

Dr. W. A. Bryan, in a recent course of lectures, very forcibly illustrated the folly of some of the medical profession in diagnosing tumors, especially in differentiating a benign from a malignant tumor, waiting for development. As I understood his insinuation, it meant that their prescriptions should have gone to the undertakers rather than a surgeon or a drug store. So let us be on the lookout and if these cases are discovered early enough may be relieved without any surgical operation or by a slight operation through the meatus, or prevented by removal of abscessed teeth infiltrating through the floor before the bone is broken down or destroyed.

Several operations are practical and recommended. Some advise drilling through a tooth socket, or just above the root apices, making an opening about one-half centimeter in diameter, inserting a drainage tube, washing out about twice daily. I do not think this method successful. In many cases permanent relief, it is claimed, may be obtained by one of the operations which are collectively styled the Mikulicz, which consists in establishing a large permanent opening between the antrum and nose through the inferior meatus.

"Schaeffer describes a method of puncturing the sinus through the lateral wall of the middle meatus. Various technics have been devised most of them including the removal of part of the inferior turbinate bone." (Blair).

These opertaions are successful where flushing and drainage is all that is necessary. But when curetting is necessary, where dead bone, numerous polypi or granulomas are present, and the floor of the antrum and alveolar process beneath it is diseased and broken down, this should be removed and a sufficient opening made to allow careful curetting of all polypi; dead bone and coarse, heavy granulations be removed, mopping out thoroughly with sterile gauze, leaving the small granulations so that the deeper epithelium lining the mucous follicles may bring about a re-epithelization of the surface; otherwise, unless a flap be transplanted from the nose the wound will be lined with scar tissue, which is very susceptible to re-infection.

According to Blair, the Kuster operation, of entering the antrum through a large opening made in the canine fossa, and after removing granulations, polypi and dead bone, packing or treating the cavity for a period will be successful in a number of cases, but not in all, for the opening eventually will close and the suppuration is liable to recur. Technic for this: an incision is made down to the bone over the canine fossa in the upper fornix. The soft tissues, including the periosteum, are raised with an elevator, and the anterior wall is removed with a perforator and biting forceps until the opening is one and one-half centimeters in diameter, then a light is thrown into the cavity; all diseased tissue removed, and any septa present are broken down. The cavity is loosely packed with gauze saturated with a compound tincture of benzoin, the end of the gauze protruding into the fornix. Subsequently the cavity is irrigated daily, and when suppuration ceases, the wound is allowed to close.

The Mikulicz operation has been combined with the Kuster under the name of the Caldwell-Luc operation, which is really a radical procedure, giving free access to the cavity and also providing permanent drainage. In this operation the diseased tissue is removed, and the mucous lining of the inferior meatus is turned into the floor of the antrum. Then the opening through the canine fossa immediately is sutured, and all other treatments are carried on through the nasal opening. It is difficult even by this means to remove granulations or diseased bone from the anterior inferior angle of the cavity, and these may cause infection to persist.

Another operation described by Blair is the Denker operation, which gives free access to the sinus, provides permanent intra-nasal drainage, requires a little less skill than some of the other methods, and is applicable to many cases of chronic antral suppuration.

The Labio-gingival incision is made as in the Kuster operation, but extends to the median line. The soft tissues, including the periosteum, are elevated, the antrum is opened through the canine fossa, and the lower part of the bridge of bone between the antrum and the opening of the nose, is removed. This piece of bone is thick and will require strong biting forceps. By this the anterior inferior angle is opened and the sinus is accessible for curetting. Bony partitions should be removed along with such pathological tissue as may seem expedient. If there is to be a mucous flap turned from the nose to the floor of the antrum, its future site should be freed of all mucous membrane; otherwise, mucous follicles might be buried under it and give rise to cysts. The next step is to free the mucoperiosteum from the bony wall of the inferior meatus and from under the surface of the inferior turbinate bone, having incised the mucoperiosteum, it is elevated and converted into a flap, to be turned outward into the floor of the antrum. Finally, the bony wall of the inferior meatus, with the mucous covering on its antral side, is removed with bone forceps. The flap of nasal mucoperiosteum is then turned into the floor of the nose and held in place for twenty-four to forty-eight hours with an antiseptic gauze pack, the end of which protrudes from the nostril. The wound in the vestibule of the mouth immediately is closed with sutures. This operation eliminates the sacrifice of the inferior turbinate bone.

The cases that usually are referred to the dentist or that we more often discover are those where the roots of the biscuspids or molars extend into or through the floor of the antrum. Operations for these are simple. If sensation is blocked off at the sphenomaxillary fossa, and the tooth or teeth that are in the diseased area are removed, then with a blunt probe feel in the sockets to find if floor of antrum is perforated; if so, peel back soft tissues with a periosteum peeler, and with bone-biting forceps trim away all diseased process and bone, taking care not to bite off too much at a time or you might fracture wall beyond where it is necessary. After smoothing up bony edges with chisels and bone currets, or burs if necessary, remove all polypi or granulomas and break down septal walls if they are present, then wipe out the entire sinus with sterile gauze, spray out daily with normal salt solution until the maxillary hiatus permits the passage of solution from the antrum into the nose, if hiatus should be stopped up. If however, the hiatus does not open up after inflammation is allayed, an opening should be made through the wall into the meatus. Keep antrum packed with gauze, saturated with camphorated oil, or I prefer muco and dithymoldiiodid, as it has less taste and odor to it and also keeps the gauze from clinging to the mouth of the wound and producing pain when dressing is removed.

Remove the packing each day for first two or three days, then leave it out and instruct patient to take normal salt solution into mouth and force solution out of nose about every two hours. If so much of the soft tissue is destroyed that it keeps wound gaped open, it is well to make a rubber plate to be placed in mouth while eating, instructing patient to cleanse well each time before using it. After having controlled or stopped suppuration, it is well to examine and spray out sinus every few days as prognosis may indicate; time of healing ranges from three weeks to a year or more. Infection may occur again, because an antrum once diseased is more susceptible to infection than one never before diseased. A good preventive is the consistent daily use of a Thudicum nasal douche using normal salt solution about blood temperature, keeping the oral cavity clean and keeping in as healthy condition as possible so it will have maximum resistance.

A mucous cyst may form in antrum on account of obstruction of maxillary hiatus. This mucus will obstruct both X-ray or transillumination. Pressure of a cyst may cause pain, or may thin and distend the walls of the antrum. It is to be differentiated from chronic suppuration by making a puncture.

Treatment consists in furnishing a permanent outlet to the mucus. If it is due simply to the closure of the maxillary hiatus, a supplementary one should be made in the inferior meatus; if the distention is due to a cyst, the antrum should be opened and the free part of the cyst wall excised. Tumors found in the antrum are fibromata, osteomata or sarcomata, from its walls, epitheliomata from mucosa; odontomata, or a dentigerous tumor. Benign tumors distend or cause absorption of its walls, while malignant tumors infiltrate.

Benign tumors are to be removed after opening antrum from within the vestibule of the mouth, while malignant growths will demand the total or partial removal of the maxilla depending on size and location. (Blair).

Some members of our profession and of the medical profession have criticised other members and remarked to patients that they had a hobby of going into antrums. Now it is possible for a man to make a mistake in diagnosis, and of course ruthless cutting into healthy sinuses would be malpractice; therefore, we should study the symptoms both local and constitutional. Take sufficient X-rays to get radiographs from different positions. Then if the loss of a tooth or teeth is required, feel with probe as to the condition of the floor of the sinus. But because we do not find as many diseased antrums as some other man, let us not criticise him unless we know positively that he is making incorrect diagnosis. If we should go out to hunt ginseng, we wouldn't find nearly so much as a country boy who had raised it and had been finding it often. Then too, when a man has operated on a few cases where patients were getting in desperate condition, such operations start a chain of recommendations to people in similar condition, and more cases will fall in his hands than to others. We see very few cleft-palate cases in our practice, while the oral surgeons who do plastic and cleft-palate operations, see many. Should we say they manufacture them or clip the lip and make a cleft for their patients because we practice for years and never see one? Yet I have heard of men saying they had practiced for years and never had had a patient with sinusitis or diseased antrum; therefore, they knew the man that had operated on several a year, or perhaps several in one month, was imposing unnecessary operations on his patient. But as amalgam fillings, block anesthesia, the gold inlay and other things met opposition, so does most every phase of our work. So it is up to us as a profession to hold up our standard and take advantage of every opportunity to become more efficient in our diagnosis and judgment and our work not only in sinus treatment but any and all that we undertake.

Let us remember that prevention is of more value than treatment to cure, and in examination of teeth in region of antrum keep in mind that a small pyorrhea pocket, faulty contact point or an improperly-contoured restoration, or an improperly excavated tooth cavity, or a metal filling placed too near a pulp, or pulp extirpation and root-canal filling, no matter how thorough, may be the primary cause of an infected antrum, if the root apices are near the floor of the antrum.

If no other benefits are realized from this essay than to make us more cautious when treating and filling teeth in region of the antrum floor, I will feel well repaid for the time I have devoted to its preparation.

OBSERVATIONS OF VINCENT'S STOMATITIS COMMONLY CALLED, "TRENCH MOUTH." *

BY J. GUILFORD SHARP, D.D.S.

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DURING THE COURSE of the American E. F. a condition commonly called "Trench Mouth" presented, quite numerously in certain areas, in others only a few cases were noted, but in some instances men were invalided to hospitals where they stayed for several day or even weeks, thus decreasing the effective man-power of the combatant forces. This condition was not confined to the American E. F. for it was noted among the Allied Forces as well. A bacteriological study was made, with the report that the prevailing bacteria were the spirillum and the fusiform bacillus, the combination known as Vincent's.

The disease is an infective, ulcerative stomatitis usually appearing as a yellowish gray slough about the gingival borders of the gums, especially about the interproximal spaces. It occurs sometimes as a line around several teeth, while at other times there are larger sloughing

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*Read before Tennessee State Dental Society, September, 1919.

areas involving all the teeth. Occasionally none of the teeth are affected, the condition appearing as an ulcer which may very in size from a small pea to that of a half-dollar, or as a number of various sized ulcers upon the mucous membrane of the cheeks or palate. These ulcers bleed very easily and in severe cases are extremely painful, so much so that the patient is unable to masticate his food. In some few instances the gums are smooth and slick, and appear as forming a straight line around several teeth where the interproximal septa of gum has been lost. This is not an acute period, nor is it an early sign but should be watched carefully for a recurrence of the ulceration.

The infection involves the superficial tissues, and does not, as in pyorrhea, have a tendency to form pockets. The condition resembles salivation somewhat except that the teeth do not become so loose or sore to percussion, the pain coming mostly from the gums.

In his Modern Medicine, Osler describes ulcerative stomatitis: synonyms—stomacace, phlegmonous stomatitis, putrid sore mouth. He says, "the term ulcerative stomatitis is loosely used to designate ulcerative conditions in general as well as a specific disease of indeterminate etiology." The likely places of origin are: the lower anterior teeth, the buccal surfaces of the posterior upper and lower teeth, and about a partially-erupted or impacted tooth. The retro-molar mucous membrane is also a common place of origin especially if the tonsils are first affected.

Various kinds of treatment were tried by the different dental surgeons, some preferring methelene blue, some chromic acid, phenol, and many others. Of the cases coming under my observation, possibly one hundred and fifty or two hundred, and occasionally as many as thirty-five or forty at the same time, a trial of the different methods of treatment was made, with the result that a certain routine was established, that is, as far as evacuation hospitals No. 2 and No. 49 were concerned. We were getting results and that is what is desired whatever the method of treatment may be. A smear was taken from each case before the treatment was begun, then occasionally as the case would warrant. In the big majority of these smears the Vincent's organisms (the spirillum and the fusiform bacillus) were found, some slides of which the bacteriologist termed beautiful "type" pictures, while in some few cases the organisms were not present even on second smear, but this may have been due to faulty technic.

Every means of treatment that was available was tried. At first the tincture of the chlorid of iron was used but soon discarded because of its effect upon the teeth. Nov-arseno-benzole proved fair by a local application every two hours, but recurrence soon followed, and again the difficulty of obtaining this drug soon excluded its use. Trichloracetic acid, ten per cent. solution, was next used by a local application, once daily, followed by a saturated solution of sodium bicarbonate. This showed the best results of any so far. Zinc chlorid had little or no effect. Chromic acid, having great favor with many, was tried with good results, but this drug was hard to obtain, consequently could not be used as a routine. It seems less irritating than trichloracetic acid, but in my opinion is not its equal. It was applied locally in a seven per cent. aqueous solution. Where the teeth have become sensitive, tincture of benzoin compound painted on the gums and around the necks of the teeth helped to relieve the pain.

CAUSES

The causes are: *First*, an inflamed and lowered or sluggish resistance of the mucous membrane of the mouth until the tissues are no longer able to withstand the action of the bacteria. This is due to a continued local irritation for the mouths, are, as a rule, the long neglected kind where the tooth brush is a matter of history rather than in daily or proper and sufficient use, and where there are large deposits of calculus or food debris around the teeth. There may be also a partially-erupted or impacted tooth, or carious teeth where the normal proximal contact point has been lost. The continued use of tobacco is a factor in the production of the lowered resistance of the tissues; *second*, the action of the bacteria (Vincent) on the already inflamed tissues. And as a predisposing cause, pyorrhea and syphilis may be mentioned. The presence of pyorrhea or syphilis aggravates the condition and makes the destruction more rapid and extensive, and treatment is not as effective. The mercurial treatment in syphilis may promote to activity an otherwise inactive case.

In his Modern Medicine, Osler states that, "in addition to the common pyogenic organisms Bernheim, Nicolot and Marotte found the fusiform bacillus of Vincent, which probably is an important factor in the production of the disease."

DIAGNOSIS

These cases will present a bleeding and sloughing of the gums especially about the interproximal spaces of the teeth, or they will show ulcerated areas of the mucous membrane of the cheeks or palate. The gums are congested and highly inflamed. The sloughing areas are yellowish gray in color, and mouse-eaten in appearance, and affect the superficial tissues. The ulcers bleed easily and copiously and leave a raw surface if touched; they are larger than the canker sore and, as a rule, extend rapidly. There is great pain and tenderness of the mouth, especially if food is attempted to be eaten, or the gums irritated in any way. The mouth presents a very dirty appearance, particularly about the affected area. The breath is fetid. There is not an excessive flow of saliva as compared to the drooling of saliva in salivation, although it is temporarily increased during the actual treatment. These cases may or may not run a temperature, although some develop one hundred and one or one hundred and two F. Cervical glandular involvement usually is absent. There is sometimes a history of the mouth or throat becoming sore a few days before the ulcers were noticed. Some may have a Vincent's angina also. Pyorrhea must be excluded although the two may sometimes be found in the same mouth. The ulcers must be differentiated from syphilis, using the microscope and the Wasserman test as an aid.

PROGNOSIS

The prognosis is good in most cases; fair when complicated by pyorrhea. In syphilis, under treatment, fair after one month or one month and one-half, or when the mercurial treatment has been stopped or has ceased to activate the condition.

Some cases do not recover after weeks of treatment, the teeth becoming so loosened and exposed that extraction is necessary.

TREATMENT

The treatment consists of the removal with cotton of the sloughing tissue, and the application of trichloracetic acid (ten per cent. solution) to the parts until the hemorrhage has stopped and the tissues are blanched, then thoroughly washed with a saturated solution of sodium bicarbonate to neutralize the effect. This is done once a day for two or three days, then the teeth are scaled. A few days later the teeth are scaled again and thoroughly cleaned. A mouth wash should be prescribed for use three or four times daily; for this Dobell's solution, or potassium chlorate, or a warm saline solution is of value. The scaling and cleaning is not done at the first sitting because of the pain and inconvenience to the patient, as it can be done later with little discomfort.

The application of trichloracetic acid is continued daily for about a week or ten days, then every other day is sufficient. At the end of the second week every third day usually is often enough, but this should be continued until there is no further evidence of the disease. Stopping too soon will likely result in a recurrence. If the solution of trichloracetic acid is too strong or the application too frequent the result will be a burn and sloughing of the healthy tissues as well as the ulcerated parts. After the ulcers have disappeared it is of value to massage the gums for two or three minutes twice daily. The patient is discharged with instructions to report every four or five days for examination and treatment if necessary. The patient should be instructed in the use of the tooth brush, softening it in warm water; standing in front of a mirror so as to clean the teeth and at the same time not injure the gums.

Some of these cases will be cured in from seven to ten days but as a rule it will take longer, especially if there is much bridge work, or anything that will act as a local irritation or hinder the acid from reaching the desired areas. In cases that persist for several weeks it is advisable to use chromic acid instead of trichloracetic as it is less irritating and can be applied daily.

The elimination must be kept in order, if necessary by the use of cathartics. Rest and confinement to bed if there is an increased temperature, if not some exercise is of value. Regulation of the diet so that the patient will have sufficient nourishment of a character that will not irritate or injure the gums. Smoking should be discouraged during treatment. It is not necessary to clean the mouth during treatment alone, but thorough and proper use of the tooth brush must be continued or else a recurrence will follow.

Although there is little evidence of transmission from one case to another it is advisable that each patient shall have his own dishes, spoons, etc., to eliminate a possibility of a further infection from this source.

If the tonsils are inflamed or there is a sore throat it is advisable to have this condition treated by an ear, nose and throat specialist at the same time that the dental treatment is being done.

RESUME

The condition known as "trench mouth" is a Vincent's ulcerative stomatitis and is found in the mouths that have not had the proper care with regard to cleanliness, or where there is a constant local irritation that keeps the mucous membrane in a state of lowered resistance to such an extent that the bacteria (Vincent) are able to destroy the tissues. The prognosis is not favorable in all cases, some resulting in a loss of the teeth.

The treatment consists principally of two things: The continued prophylaxis and the application of trichloracetic acid or some effective drug, which will reduce the ulcerations.

DISCUSSION

President Rich: You have heard the reading of this most interesting essay, and I am going to call upon another young man who has seen active service with the A. E. F., to open the discussion, Dr. Walter Morgan, of this city.

Dr. Walter Morgan, of Nashville: I have been very much interested in Dr. Sharp's paper. I consider that he has covered the field well. He has been clear; he has driven the fundamental points; he has touched them all well. At Base 13, we were unable to obtain chromic acid; we were forced to use the methylene blue, which we would use in powdered form, massaging the gums. The French seemed to prefer the use to the chromic acid, ten per cent. solution. We used very often Dr. Gilmer's treatment there. Dr. Gilmer says that as long as forty years ago he recognized this disease. It was not until May, 1916, in the *Dental Review*, that he published his first article on it, a copy of which I would be glad to turn over to any who would like to see it. Dr. Gilmer's treatment was the use of one-tenth grain calomel, four times a day, followed by a saline; and, of course, the local treatment; then he used as a mouth-wash peroxid of hydrogen, which is spoken of in his paper as pyrozone.

The use of dioxid of hydrogen of course inhibits their growth. After he used the dioxogen, he would paint the gums with a compound tincture of benzoin.

He had not at the time the article was written discovered the organism. The organism was discovered at a later date, through the aid of Dr. Tunecliffe, of Chicago.

I merely make mention of that treatment because we found that some cases would not respond to either the peroxid or the methylene blue, while it did respond to this treatment, whether through faulty technic in the treatment or not I cannot say.

I do not see how I can criticise Dr. Sharp's paper. I think it is just what we all ought to know, and I gained a great deal of information from it. I thank you.

PRESIDENT RICH: I would like to hear further on this interesting subject. Since we did not go with the army where we could be instructed upon these cases of trench mouth, I have seen one or two cases that I thought seemed to be this trouble, and any information that we have that will enable us to treat such cases to better advantage, I would like to have, and to hear further discussion if any one can add anything to what we already have heard.

DR. STONE: I have had five to return from the army, and back to civil life, who have come to me with this very condition, and through trying out a great number of different drugs and treatment I have come to this conclusion. The trichloracetic acid I have used to advantage. But I want to say that to me the greatest thing that the man who has seen service in our army hospitals brings back to us is the fact that he repeats in specific form some of the specific causes of the different lesions found in the mouth. In the army hospitals they found out the bacillus or the bacterial origin of whatever they treated. We have not done that as a professional body of men. We simply talk in terms that give us no clue to the bacterial origin of the lesions that we treat. The men who have been in the service and come back here, have gone to the bottom of this thing, and they know exactly what bacteria they had to exterminate in the treatment of the different lesions; to me that is one of the greatest things that the men have brought back from the army. But I want to ask Dr. Sharp if he has found a hyperacidity of the oral secretions in these cases; I have, and if he gives any systemic treatment for overcoming that hyperacidity?

DR. L. G. NOEL, Nashville: I want to express my pleasure and approval of Dr. Sharp's paper. I have known Dr. Sharp since he was a junior student, and I always have admired his studious habits, and it gives me positive delight to hear him come up here and read a paper of this character. I had the pleasure of looking over this paper before he read it, and of expressing my approval of it in a general way; and yet there are some things that I would like to express my difference of opinion about, not only with Dr. Sharp, but with all of these young army surgeons who insist upon calling it "trench mouth." I do not like the term. It is like applying the term "pyorrhea alveolaris" to all gingival affections. It does not seem to be suitable at all. We have been seeing this in private practice, as Dr. Morgan has stated, ever since Dr. Gilmer's article, years and years ago, in the *Dental Review*. This stomatitis does not differ very much, as it has appeared in the army hospitals, I imagine, from what it appears in private practice. I have seen quite a number of young men who have come back from the army suffering with this trouble, and I have no doubt that their habits of life and their lack of general oral cleanliness, and especially their addiction to cigarettes has given them far more cases than we see in private practice; and I would warn those of you who are not paying much attention to the pathology of these affections against confusing this condition with Vincent's angina; it is quite a different thing—not so much in its bacteriological aspect as in its general symptomatology. In Vincent's angina we have these fusiform and spiral-like organisms fixed in the glandular tissues and in the soft tissues of the floor of the mouth, and the patient's throat is considerably swollen, and the most prominent symptom is a choking sensation caused by that violent oedema of all the tissues of the floor of the mouth and of the glandular structures located therein. We do not have this in this form of stomatitis. It is a different thing altogether from Vincent's angina. It may be spoken of as Vincent's stomatitis. I would suggest a more suitable term, to my mind: hemorrhagic stomatitis, because in nearly all these cases we have that hemorrhagic feature; sometimes, patients who are suffering with a violent attack of it will have so much bleeding of the gums that the pillow where they have slept will be found bloody in the morning.

Dr. Sharp very properly alluded to the bad effects of tobacco, and the fact that it ought to be withdrawn in the treatment of these affections, but I do not think he stressed quite enough that habit in its etiological aspect to this trouble, because it has a peculiar effect in the mouth, if the patients smoke all the time during their waking hours, cigarettes especially, the heat of the tobacco infusates a mucus in the mouth, and causes its deposit on the teeth; and patients who are not careful and cleanly and do not use the tooth brush and other means of oral cleanliness, and who are smoking all the time, will have the filthiest mouths that it is possible to conceive of, and I think they have produced a great many cases. It lowers the vitality of the oral tissues, the oral mucosa and cells, and the oral mucosa have their vitality so lowered by the constant use of cigarettes, constant smoking, or constant use of tobacco in any form—and some of them used it in all forms—that any organism that is present in the mouth finds ready fixation in those sick tissues. These organisms probably are present all the time, especially in camp life and in trench life, but in order for them to get in their work and fix themselves and grow upon the tissues, the vitality of those tissues must be lowered by some cause, and there is no cause so potent as constant smoking.

I preach on this subject to my students until they get tired of hearing me, and I think they go away thinking that the old man is simply crazy on that subject, and they do not pay much attention to it. But you know, and you all know, that if you go to any physician who is treating specific troubles, a syphilitic affection, or any specific trouble that expresses itself in the mouth or in the throat, he will tell you to quit smoking, that he cannot do anything for you as long as you keep up your smoking, and he is right.

I have found, in regard to the treatment of this affection, one of the first things is to remove all deposits, and establish a habit of thorough cleanliness, the use of mouth washes. At first we find it absolutely impossible to use the brush, because the tissues are so inflamed, there is so much *inflammation* of the mouth, and such a tendency to bleeding, that we cannot introduce the use of the tooth brush, which usually is quite unknown to such patients; they have gotten into that condition because they have not been brushing their teeth. We can lower the hemorrhagic condition by the use of such astringents as trichloracetic acid, methelene blue, or chlorosene, the remedies that have been mentioned by Drs. Sharp and Morgan. Of the three I have found the trichloracetic acid the most efficient, and I would like to ask Dr. Sharp, when he makes his closing remarks, to tell us whether he has tried aluminated ipecac in these cases. It has been my observation that that is about the only value that the drug has in treating gingival affections, that it relieves the hemorrhagic condition, it tends to lower the congestion of the tissues, and I think that it would be a valuable agent, a valuable adjunct for the treatment of these cases. But you cannot cure them unless you can change the habits of the patient, stop his smoking, cleanse his mouth and make him keep it clean. The deposits must all be removed frequently. We find plenty of them, and we frequently find, as the essayist has told us, that there may be some pyorrheal pockets that must be treated We must rout out every habitat of these organisms, cleanse the mouth thoroughly, bring about a changed condition, and maintain it in that condition. There is one old remedy for stomatitis that is most valuable, and I would suggest its use in these cases, that is boric acid. Boric acid is most valuable.

DR. CELIA RICH, of Nashville: Like the doctor who has just spoken, I wish to express my appreciation for this most excellent paper; but that would hardly be an excuse for getting on the floor and saying that every member present enjoyed and profited by that paper, but it just happens that I have used the treatment that has been recommended by a great many, that neither Dr. Morgan nor Dr. Noel nor Dr. Sharp has especially recommended, that was the methylene blue, and have had very good results with it. My reason for using that was, in the first place, a paper that we had from Dr.

Chas. F. Pickering, of Clarksville, shortly after his return from abroad. He said that in the hospital in which he worked, the methylene blue was the principal treatment used there, and naturally when I had a case of trench mouth, I tried methylene blue the first thing. There was another reason for using it. The condition was different from any former gingivitis that I had seen, and I had a bacteriologist to take a smear, and make a bacteriological examination of it, and found what Dr. Sharp calls a very beautiful specimen of Vincent's fusiform bacillus. And I found the specific treatment for this Vincent's angina that has been recognized for so many years was the methylene blue. And putting two and two together, I knew and used the methylene blue, and have had very good results from it. There was another point he made that I wish to thank him for, particularly, that is his suggestion about having the patients brush their teeth before a mirror, while this condition obtains, for the reason that while the gums will scarcely stand the touch of the brush, it is of the utmost importance that the teeth be kept as clean as possible during the treatment. In fact, I think one reason we are treating these cases so long after they have returned from France is that, even after they have been built up physically by careful treatment, in many cases the men did not see a dentist shortly after their return, and they are not in the condition they were left in, but in the condition they were usually in at home; there are cavities in the proximal surfaces of the teeth and deposits on the teeth, which predispose them to every diseased condition, that is why I consider this matter of brushing the teeth as of the very utmost importance.

Dr. C. O. Rhea, Nashville: I am sure we all have enjoyed this paper, and the discussions, as it is a very important subject, one that perhaps most of us have seen cases of, or at least, thought we had. There is one thing that I arise to emphasize, and that is, that we should know what we are treating before we begin to treat. Very few men, I believe, have a proper diagnosis made of the conditions before they begin their treatment. They try one treatment, and if that does not succeed they try another. I wish to emphasize the fact that before we begin the treatment of trench mouth, that we have bacteriological slides made, and have a bacteriologist give us the exact disease we are treating, in order that we may intelligently treat the patient.

Dr. Justin D. Towner, Memphis: One additional suggestion to the many valuable ones that already have been made regarding the treatment of trench mouth, or Vincent's Angina. I wish to emphasize the point Dr. Rhea has made, in saying that it absolutely is necessary that you have your bacteriological examination made, in order that you may know the organisms present, and therefore be intelligent in the treatment of the conditions which they produce. The suggested treatment which I arise to mention is salvarsan. I have found, after considerable experience with trench mouth and angina, and one very serious case, after the extraction of the third molar, in which the patient lost the first and second molars, and the disease apparently was extending to the median line, that infection refused to heal or to show any improvement under any form of treatment, until the salvarsan was used. That was suggested to me by Dr. John J. Ogden, who has had very valuable experience abroad in the hospitals, and his suggestion, together with the results he claimed that were secured in the various hospitals with which he was connected, led me to try it; and in the cases where I have used the salvarsan there never has been any doubt of improvement from the first application. That can be used in two ways. You may get a three-tenth tube, perhaps that would be better. I have used the six-tenth ampule. You can break your ampule, dissolve the six-tenth in four or five ounces of sterile water. If you have not the sterile water handy, as was often the case in the hospitals abroad, you could use the ordinary tap water; but the preferable way, of course, is to use the sterile water. Empty your powder of salvarsan into the water, and give it sufficient time to dissolve. It dissolves very slowly. If you try to hurry it by stirring, you will get an agglutination of the powder, and you do not get the full dissolution of it. That must be used as a douche, as a mouth wash, as a spray, and used immediately. You cannot mix a solution and hold it for future application, because it oxidizes, and in that event becomes an absolute poison. Another way of application is to open your ampule, put the powder in a container and take your sterile cotton, moisten it either with water or glycerine, and dip it into your powder and apply it to the affected part.

I had a case of angina in which the tonsils were involved, as is often the case, so much so that the young man could hardly swallow, and he was in a very serious condition. I applied the salvarsan in the powdered form, directly to the cortical tissues, as well as to the gingival area, all the time keeping the prophylactic element uppermost, and seeing that the exposed surfaces of the teeth were kept just as free from accumulation as possible. I mention that because it has proven very valuable in my hands. It is simple, and now, since salvarsan has become an American product, it is not expensive.

Dr. J. Guilford Sharp, Knoxville (closing): I want to thank all those who have taken part in the discussions, and try to answer some of these questions.

In regard to the questions which Dr. Stone made about the hyperacidity, I tried that with litmus paper; I tested out a number of cases, and I never saw any that had a hyperacidity. But I won't say that is the case all the time, because the litmus I had may have been old, and not easily affected; but so far as I could see, I did not find any with marked hyperacidity.

The point that Dr. Noel brought out, about smoking, I think is a most important one. I think we all realize how much effect the constant use of tobacco, or the too frequent use of it in smoking, any way, affects the mucous membrane. I never have tried the aluminated ipecac on any of these cases at all. I had known of it, but I don't know that I would have used it any way, because I would not have thought of it.

As far as Dr. (Celia) Rich's methylene blue, I did not use any methylene blue at all. We had that in the laboratory, but I think that is one of the methods of treatment that I did not use. I know a great many of them did use it, and seemed to get fairly good results.

The point that Dr. Towner brought out, about salvarsan, I would like to ask him how frequently he applies that solution.

Dr. Towner: In the cases I have had I have treated just once in twenty-four hours with the salvarsan, If you apply it in the powdered form, it stays in the mouth for some time, in fact, it is very annoying to the patient; it sticks to the tissues just like candy will, and they express some little annoyance, trying to free the gum of that coating of salvarsan. Of course that makes it all the better for the treatment of the disease.

Dr. Sharp: We used a clover-scented benzole, it is somewhat the same thing, in solution, mixed up in those ampules. All you had to do was to break one end of the ampule, and fill it with distilled water; we used that every two hours, or simply applied it locally to the parts and I did get some results with it, but we had a very limited number of those ampules, and as Dr. Towner has said, it disintegrates readily. We had to discontinue the use of that entirely. It was very hard to get enough salvarsan to go around to all these cases, so we had to eliminate that entirely. I thank you.

EXPERIENCE IN A BASE HOSPITAL IN FRANCE*

BY WALTER M. MORGAN, D.D.S., NASHVILLE, TENNESSEE

AS THE TITLE of this paper indicates, it covers a very broad field. It is my experiences in a base hospital in France, and with your kind indulgence I will try to tell you some of the things that Lieut. Pickering and I encountered.

Base Hospital 15, from the Cook County Hospital of Chicago, was organized as a base unit; in that way we were allowed to select some of our own equipment, and we were more fortunate than some, in that we could obtain some things through the Red Cross which the government would not supply.

The thing that impressed us the most after a few months' experience, was the condition of the mouths of the men that came under our observation. We thought when we were on this side that all the dentists were in France, and when we got over in France, we were convinced that they were all on this side. We had more work than we could do. At no time were we satisfied with the condition of the mouths of our patients that were in our hospital. There was entirely too much work for us to do. There was sufficient work for four men. We were organized as a base hospital of five hundred beds; when we got to New York we were increased to the capacity of a thousand. When we arrived in France we were stationed at Le Moges. Soon after the Chateau Thierry fight we were enlarged to fifteen hundred with no increase in personnel; it only meant an increase in the number of patients that we were to handle. Just before the Argonne, we received word to increase to our largest capacity, which was twenty-four hundred beds. Now, you can imagine the amount of work which you would find among twenty-four hundred men, who were unable to take care of their mouths, some of them—a great majority, I might say—and I think Dr. Pickering will bear me out in the statement—a great majority of them never had been in a dental chair in their lives.

We endeavored to do the work we did the very best we knew how. We were advised by some of the regular army men that quantity was what they wanted; we received letters to that effect; we paid no attention to them at all. The facts were, that we wrote letters back, through military channels, that we did not intend to do a great amount of work; that our ambition was to do, and our practice would be to do the best we could for the boys, regardless of the time it took, taking care of the emergency work, of course, at first. I am glad to say that Colonel

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*Stenographic report of a talk before the Tennessee State Dental Society, 1919.

Robbins, our commanding officer, a regular army officer, recommended to the chief surgeon that that policy should be carried out.

The most interesting part of the work which we had was new fractures, the oral plastic, you might call it; very little plastic being done, because there was not sufficient length of time. We were there only ten months. The hardened soft parts, with the complications of the bony parts; all the cases infected; in the healing the bacteria would heal within the scar tissue. To do a plastic in such a case as that would mean merely a loss of the parts. You would have to give Nature time to remove the infection before any plastic could be done. For that reason we saw very little of it; practically none.

Many of the cases when they presented themselves to us, exhibited much swelling or œdema; fragments were forced out into the soft tissues; teeth that were fractured became missiles and were forced into the tongue and the soft parts; all of those had to be removed. The treatment that we followed until the swelling had subsided was merely irrigation, usually with potassium permanganate—there is a fetid breath—potassium permanganate in one to three thousand solution. As soon as the swelling subsided we immobilized the parts as best we could. The system that we used most, that is, after we first started operating, was Dr. Gilmer's intermaxillary wiring. I have one case, here in which the arch-wire was Angle bronze wire, eighteen gauge; while the wires around the maxillary teeth were twenty-six and twenty-eight gauge iron wire. Those wires around the teeth were annealed after being invested in fireproof investment. The theory was that there would be less stretching of the wires; all the wires must be twisted in the same direction on both the upper and the lower teeth; that is, the wires anchoring the arch wire to the teeth, because when you add your intermaxillary wiring, if one is twisted one way and one the other you will get a loosening of the wires.

The teeth never must be wired while there is food in the stomach; that is, the jaws wired together, because in case of nausea or vomiting, you possibly may get a strangulation of the patient, which is very inconvenient. We were advised before we went over to use this method, or use some method which would be very easy to open in case of nausea, as we thought that some patients would be transported across to England. In crossing the Channel, of course they fear seasickness, and the wires must be well down on the maxillary teeth. Should any of the teeth be very loose in the alveolar process they should be wired to the next tooth in the same arch, never either to the superior if it is an inferior tooth, or *vice versa*.

Vulcanite splints were discarded; they were entirely too dirty; it was impossible to keep them clean. Swaged splints were found inferior to the cast splints; the cast splints we used mostly, and the French used a combination of silver and copper, three parts of silver to one part of copper. In some cases cast by the French, the silver and copper flanges were used; that was in case of a simple fracture; the flanges were used to prevent a luxation in the muscles on the side which was fractured. There are various methods of splinting. We saw a number of them in the French hospitals, and it seemed to us that one was left to his own ingenuity as to which would be best.

There is just one other thing that some of you might be interested in. That is, a composition of kaolin, glycerin and gelatine, that was used by some of the French. They would take an impression and make this model or casing prior to doing the plastic; then they would do the plastic on these models .

I can give you the exact proportion if you would like to have it. The gelatine and water are placed in a double boiler and boiled for one hour; then mix the kaolin and pour it into the model. It can be colored with carmine or picric acid, or with yellow ochre.

DISCUSSION

DR. CHARLES F. PICKERING, Clarksville: I do not know that I could say a thing on the subject. Dr. Morgan has covered it all. I think he has mentioned pretty near all that we did there. All of our work was very interesting of course, but the greatest objection to it—and he will agree with me, I think, is that none of the work could be followed up, and we could see the final outcome of very few of our cases; and of course, we would get interested in things, and then we would get orders from the chief surgeon to get rid of all patients, and of course when orders like that came in, we knew we had it to do. And that was always what was before us—get rid of all patients every day that could be gotten rid of, so other patients could come to the hospital; so we were up against that all the time.

Dr. Morgan mentioned the fact that we *worked* in France. I agree with him there too. We would get a big convoy of patients in some night, maybe four or five o'clock, and maybe we would work until twelve; and we would get a lot of patients in on stretchers, very sick men, under temperature, of course; that was all that was the matter with them, but just that alone was enough, a reservoir of infection—the mouth—sick with fever, back from the front on stretchers with "trench mouth."

In the treatment that we used we feel that we got wonderful experience in many ways. Our associates there, were the French and the other Americans in the service; the other Americans "bawled us out" sometimes about the work that we did, and then we did a lot of "cussing" out of them, sometimes, about the work that they did; and we did a lot of cursing when complaints came through military channels; and as Dr. Morgan said, we had an excellent officer who came through our office every day and saw that we were working. Of course, we had to be there every day because of our patients that we had to take care of. As a rule we would not have to go to him; he would come to us. Others would go to him and he would send them over to us. One time I said to the Colonel, "We got a letter from So-and-So, a regular army man down here, about how much work we should do in a day, and we want to answer it back through military channels and get you to put your recommendation on it." He would always say, "I am glad to do it." And we would shoot it back to them, especially to the regular army men who would jack us up, and tell us maybe they wanted us to put in fourteen or fifteen hours a day, and do a prophylaxis in thirty minutes' time. So we certainly had the cooperation of our commanding officer there, and Dr. Morgan and myself, of course, did our very best in everything, and it was a great pleasure, as I say, to have such a man as that and be able to do conscientious work, and we did do it and most all of the men there did it too.

I often told Dr. Morgan that when I got out in the profession a little more, and became an older man, I ought to publish an article some day, if I could, in the dental magazines, wherein we could mention some of the facts that we saw there, some of the work done by the regular army men. Some of them, of course, were excellent men. But we both expect some day to write something about such things as those that we saw there. I don't know that I could mention anything at all of interest aside from what Dr. Morgan has said.

PREVENTIVE DENTISTRY AND ITS RELATION TO THE FUTURE PROGRESS OF THE PROFESSION*

BY WILLIAM F. STONE, D.D.S., CHATTANOOGA, TENNESSEE

THE SUBJECT which I have chosen to present, appears to me to be the most vital issue which is facing us today—which is facing the whole civilized people of the world today—an issue which is squarely up to the dental profession to meet and at an early date.

Today, we are exactly where we were during George Washington's time. He wore artificial dentures, possibly a little more crude than those of today. The methods by which he was relieved of his natural teeth were perhaps a little more crude; nevertheless, he lost his natural organs of mastication and since that time until the present, the dental profession has ploughed deep into different methods, endeavoring to perfect a method of treatment which would renew and prolong indefinitely the health and usefulness of diseased oral tissues. How well we have succeeded in this task, is brought to us by the remarkably high percentage of systemic diseases that are proven beyond any doubt, by research institutions throughout the world, to be the direct results of all our years of hard labor. Until recently, we honestly believed that we were successful in our efforts to re-establish a healthy condition about a previously-infected dental organ; but today as we witness the human suffering brought upon individuals by our methods of dentistry, we have but one course left open to us—that of preventive methods.

With our present scientific knowledge of focal infection, together with the knowledge of the laity, I predict that the present generation of the human race by the time it reaches its last days will be the most toothless race that ever existed. Each day that passes, more thoroughly convinces me that a devital tooth is a menace to health and should, under no circumstances, be left indefinitely in the human jaw. A great many of you will take issue with me upon this question, though you would not, had you the opportunity to study clinically the cases which come under my observation. Hence, I reiterate the vital importance of preventive dentistry as a remedial step in the preservation of the dental tissues and the preservation of bodily health.

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*Read before the Tennessee State Dental Society, September, 1919

Some years ago we were warned that further advances in the science of preventive medicine faced our branch of the profession, and since that time we have been more alert and have been intensifying and exerting our energies toward the elimination of oral infections, which had been decreasing the efficiency of the whole human economy to the detriment of our previous methods of practice. The results of our efforts in the eradication of oral infection are remarkable when we stop and sum up the decrease in death rate, the comfort that has been given the suffering and the years that have been added to the span of life.

We have been relying too implicitly upon the findings of the radiograph. We are misled a great many times when we study a radiograph, unless we have gone further, in a great many of our cases, in the diagnosis. For instance, I have in mind at the present time six cases, and out of these six cases, four of them I have carried further than the X-ray examination or the radiagraph, and patients would come to me suffering from arthritis, iritis, etc., and in all the cases of the six I have in mind, the radiograph of the teeth that were suspicious was negative. In my findings in three of the cases with the permission of the patient, I called other men in consultation. Their findings were the same as mine. I was not satisfied. One patient—a nurse—had been in bed continuously for six weeks—articular rheumatism—out for a few days; back to bed for a few days. I made an examination, and X-rayed a gold crown, a tooth with an alloy filling in it, an upper left side first molar, with gold crown, third molar with small alloy filling, which pathologically proved negative with the X-ray; but, she continued to suffer with rheumatism. The medical man and diagnostician had been over her, made a thorough examination; and so had the eye, nose and throat specialist and had found her negative. My X-ray findings and the diagnosis I made were negative. Still I was not satisfied. She came back and was in the office for a day or two, and then was confined to her bed again for a week, when she came back again to report for duty, but not feeling well. I sent for her to come back. I removed the gold crown. The thermal tests were negative, and appeared to be vital. I removed this gold crown, went under the cement filling, and found what we term a mummified pulp. I extracted the tooth and opened up the roots. There had been no attempt at a filling. The second molar seemed to be in good condition, perfect health, no cavities, no fillings. For forty-eight hours the patient suffered intensely, mostly in the arches of the feet and in the ankles and knees. The third day there was an improvement. The fifth day was complete relief from any pain or suffering whatever, and has been so since—the first time in three years. That led me to believe that I had reached the cause of the trouble. I had five other cases that were slightly unsettled in my mind as to whether or not my diagnosis was thorough. I sent for three of these cases, and I went further; under fillings. I found what appeared to have been mummified pulps; I extracted all teeth. There was no rarification, no breaking down of the investing tissue, no change in the tissue so far as the X-ray showed. I extracted these teeth, and relieved systemic disturbances that had been troubling for years. And that leads me to believe that we are relying a little too strongly upon our X-ray for absolute proof of pathology, when it does not always show just what we are looking for. Consequently, I bring that in as an illustration and possibly to help in a great many cases where we might pronounce our diagnosis as negative when the vitality of the teeth are concerned; the teeth appear to be vital in the radiographic findings, when if you will go a little further you will find they are not. The form of infection that manifested there is possibly a very low form, and does not cause a destruction of the tissues. Surrounding tissues absorb the infection as rapidly as it is given off there, and it does not cause a macroscopical change in the periapical tissues. So possibly we are relying a little too strongly upon our X-ray findings. The X-ray is merely a link in the chain of diagnosis, the same as the mouth-mirror, the explorer and other instruments.

By our many modern methods of diagnosis, we are called upon by the general practitioner, as well as the laity, for the diagnosis and prognosis of pratically every form of human ailment today, and no diagnosis of an obscure human pathology is considered complete today, unless an exhaustive diagnosis of the oral cavity has been executed by a competent dental diagnostician. The fact that we have demonstrated to the laity the serious results which obtain in the human system by disregarding infection within the oral cavity, casts a stigma upon the honesty and integrity of the medical adviser, who fails to call for an exhaustive examination and consultation by our branch of the profession when making a thorough physical diagnosis.

In considering the entrance of various forms of infections to the body tissues, we are aware that nature has built up a very efficient barrier against all forms of pathogenic organisms. Complete annihilation of the human race would result within a very short period of time were this untrue. The skin and mucous coverings intact and in health are impregnable to all but few of these organisms. It is when a lesion in these coverings has occurred that the human organism is endangered.

AVENUES OF INFECTION

Under this head might be mentioned a great number of avenues of entrance of infections into the circulation; however, to be brief I will condense this discourse to the two most vulnerable avenues of entrance—namely: the gingival tissues and the pulp canals of the teeth. It is through these channels and in these places that the protective coverings are most frequently mutilated and nature's barriers against the entrance of pathogenic organisms are annihilated. Let us then consider that these two highways or gateways of infection are the objectives of our concerted attack, the closure of which is essential to our future progress.

Dental science is continuously mounting, mounting, mounting everywhere today, to meet the demands which are being placed upon her shoulders. Every method of scientific effort is being exercised in the eradication of periapical and peridental infections. Methods of diagnosis and treatment of these diseases have been and are being practiced whereby serious oral infections are being eliminated, and, in many instances, practically healthy conditions are being re-established, thereby preventing many serious systemic disturbances. The demands for this service is ever increasing and, necessarily, must increase, and we, as dentists, are the chosen ones to keep vigil over 60 per cent. of the public health for many years to come, if we wish to hold our own and elevate our chosen profession.

PREVENTION AND SUSCEPTIBILITY

Regarding the prevention of dental lesions, we are aware that a very small percentage of our patients appear to be practically immune to dental disease, while the great majority suffer from practically all forms of dental pathology. Just what the ideal conditions are which obtain in a mouth which is immune from dental disease, we have not been able, so far, to produce artificially. However, we who practice preventive methods are well aware that some most formidable conditions of oral pathology can be remedied and the great majority can be held in check, if proper care is given by the dentist and the necessary cooperation of the patient is obtained. It is the rule that the more nearly normal the alignment and the formation of the tooth proper, the more healthful the dental tissues, and, just in ratio to the departure from these conditions, do the dental tissues suffer. The jagged, rough, unfinished gingival margins of fillings, crowns—restorations of any nature which produce an irritation; trauma from malocclusion of natural teeth, or restorations. Traumatic, chemical or thermal injury of any nature whatsoever naturally tend to defeat our greatest efforts of today; and these are the issues which are looming large before us today and which we must remedy in furtherance of preventive methods.

Natural immunity of the oral tissues is dependent largely upon natural functioning, and just here is the direct cause of more oral pathology today than upon all other causes. Our foods of today are pre-masticated—chopped, mashed and pre-masticated in the kitchen and pantry, then placed before us to do the rest. I heard my friend Dr. Austin here, in a meeting in our little city one night, make the remark that it did not matter whether we chewed our food or not; that a dog would take a piece of meat and swallow it whole and keep fat and healthy, and switch his tail as usual; and he doubted whether or not it was necessary to masticate food. Now, there is lots of food for thought there. He may be right, I may be wrong. I may be right, he may be wrong. However, for the health of the dental tissues, they must be exercised. As to whether or not we need organs of mastication, there is where the issue arises. We will drop that.

We place this pre-masticated food in our mouths, spatulate with our tongue until it is moist enough to swallow and it disappears. Our masticating apparatus lacks for exercise, the investing tissues become congested, and the endless chain of pathological conditions begins. To condense the first principles of immunity, then, we must conclude that normal functioning of the oral tissues is the most essential process in producing normal conditions of circulation, insalivation and a healthy environment of the oral tissues; and just here there is a large field of missionary work in impressing upon the laity the great need of coarser foods and more exercises for the oral tissues. If this be impractical, resort to the next best method of obtaining a healthy circulation, that is massage and brushing of the oral tissues—not the teeth, the tissues of the oral cavity.

Since the alignment of and the formation, or development of the tooth proper, is of the greatest importance in producing natural immunity, it is of paramount importance that the child have the proper care from early dentition until the entire denture is in position; and the greatest care and attention given the little patient to bring about the normal formation of the arches. Just here orthodontia and dental pediatrics must inevitably play a large part in the future health of the coming generation.

At our state meeting, in Knoxville, two years ago, the essayist read a paper on "The Future of Our Profession," which should have been entitled "Preventive Dentistry," for it was a plea for this cause. Last year at our meeting in this city, my good friend and townsman Dr. D. P. Houston, read a paper entitled "Preventive Dentistry," and others have enlisted in the cause, which has resulted in the placing of a dentist upon the State Board of Health by our state. The very fact that the laity has awakened to the absolute necessity of more knowledge upon dental subjects alone, is responsible for this step forward. This is merely a starting point, the question of education is before us; and our duty to ourselves, our profession, and the laity, is to enlist in the practice of preventive methods. If I may suggest, I would say that the greatest impetus that could be given the profession today, the greatest service that we could render to the coming generation of our state, would be the organization in every county of the state, of an educational campaign under the direction of our Dr. Buckner of the State Board of Health, which will ultimately bring about the institution of a thorough course in dental hygiene in every school within our state.

I would suggest further that a committee be appointed by this organization to formulate a course which would be practical for introduction into our schools, and also to procure or write a text-book, which might be used individually or incorporated in some other subject, which is being used today. This is just as much a fundamental as reading, writing, arithmetic, or anything else. If your health is not good what is the use of an education?

We must today extract the teeth as we did fifty and a hundred years ago, or we must institute preventive measures. Which shall it be?

DISCUSSION

Dr. A. G. Buckner: Owing to the fact that it is growing late and that most of you are possibly tired, I shall not undertake to discuss this paper at very great length. However, I shall avail myself of this opportunity to say something concerning that part of the paper or that aspect of the question which is related to the work which I am undertaking in Tennessee. My main purpose in availing myself, as I say, of this opportunity is to acquaint some of you more perfectly at least with just what is contemplated.

It is hardly necessary, possibly, for me to say that the last General Assembly of the State of Tennessee passed a law creating an assistant secretary to the State Board of Health, who is to be known as the Director of the Bureau of Oral Hygiene, and by the authority of the law this Director has the power to appoint in each county a reputable dentist who is to be known as County Mouth Hygienist, who is to serve without compensation, and who is to work under the direction of and in conjunction with the school law. Of course, the possibilities of the law are limited, yet I want to impress you with the fact that the present law affords us a splendid opportunity for the dental profession to do an immense amount of great and lasting good to the citizenship of Tennessee, and, as I have tried to make clear heretofore in some letters that I have written, the fact that some one man in the county is selected as a County Mouth Hygienist, does not preclude the possibility of other members of the profession rendering particular and distinct service. The only reason that I can see for having a particular man designated is that there may be a head to the organization in each county in the state; for, as you know, what is everybody's business is nobody's business. Therefore, we want somebody in each county who will get behind this proposition and push it. I said to somebody today and I want to say again in the presence of this association, that I consider the fact, Mr. President, that I have succeeded in having introduced in four counties of the State of Tennesee a supplementary text-book, that that of itself, that single accomplishment, is worth every cent that the bureau has cost the State of Tennessee up to the present time.

I am today in receipt of a letter from Dr. Schwartz, of Cleveland, Bradley County, Tennessee, in which he says that the county superintendent and county board of education have assured him that Dr. Ferguson's little book on the teeth will be used as a text-book in the public schools of Bradley County; and he said to me, further, that he thought that he could assure me that this text-book would be used in the city schools at Cleveland, Tennessee. Dr. Houston told me today that the county superintendent in Hamilton County had assured him that oral hygiene would be taught in the public schools of Hamilton County, and that Mr. Jones, superintendent of the public schools in the City of Chattanooga had said that the subject would have due instruction in the schools of the City of Chattanooga. Now, we know, of course, that there was a time when people believed that by drumming on a tin pan you could frighten the demons of disease away; and we came on down then to another period when people believed that by wearing some sort of charm, or doing some sort of incantation that some certain diseases might be kept away; and we have yet, I am sorry to say, a great many people who believe that disease is a direct dispensation of Providence. Of course, we know that disease is a penalty that we suffer for violation of law. Of course, we know that dental disease is not a natural inheritance, but that it, like other disease, is simply a penalty for the violation of law; and that if we begin with the child in time, that a great deal of dental troubles can be prevented; and that if we impress upon the parent the necessity of bringing the child to the office or taking the child to the dentist several times each year, that what is necessary to be done for that child can be done without inflicting pain of any consequence, and the child soon learns to regard the dentist as his friend, and he does not object to being taken to the dentist; but if the trouble is neglected until the operation, whatever it may be is painful, then you have to bring the child into the office and hold him until whatever you attempt to do is done for him, and then whatever you succeed in doing for him is very unsatisfactory.

This question, gentlemen, is so big, and my time is so limited, that I hardly know just where to tackle it. But what I want to impress upon the Tennessee State Dental Association is the fact that I am going to rely, and in fact I am forced to rely, under the conditions, upon the entire profession in Tennessee to put this matter over. I want the absolute, earnest, sincere cooperation of every dentist in Tennessee in this work. As I said a moment ago, it affords a splendid opportunity for the dental profession to do something really worth while.

It is a conceded fact that ninety per cent. of all disease to which the human body is heir enters the body either through the mouth or through the nose. The necessity for cleanliness of the mouth is apparent for that reason, if for no other, excluding the matter of the disease of the teeth. Do you know that there are thousands of school children in Tennessee who never saw a tooth brush, who would not know a tooth brush from a chop stick; children who come from families in which the parents do not use the tooth brush, and therefore they know nothing about it. I have spoken during this past three months this summer to possibly twenty-five hundred school teachers in Tennessee. In one body at Johnson City I spoke to seven hundred school teachers, and I am pleased to say that the school teachers of Tennessee are thoroughly alive and awake to the importance of this subject, and that you will have the earnest cooperation of the school teachers of Tennessee. I have said to these school teachers that if they do not do any more than ask the children every morning, the smaller children especially, the simple question, "Have you brushed your teeth this morning?" "Have you brushed your teeth today?" "Did you brush your teeth this morning?" If they keep propounding that question to them, that after awhile that child will reach the point where he will be as much ashamed to acknowledge that he doesn't brush his teeth as he would if he hadn't washed his face. So that little thing itself will accomplish wonders.

In the plan of promoting this campaign, my conception is this: That these county mouth hygienists, whom I hope to appoint later, will take it either upon themselves or through the aid of other members of the profession in the county, to visit the different schools of the county at least once during the school term. I have an idea that I myself, will get into a great many of these counties, and spend possibly a week with the county mouth hygienist and other members of the profession, and visit the schools, not only the schools but where practicable, to go and meet the parents, and by the aid of lantern slides and charts, to show them just exactly what is the best manner and means of taking care of the mouth and the teeth.

Now, I am aware of the fact that some of you gentlemen have a big practice, and are paying out a lot of money; but I want to say to you that there isn't anybody in this association who is prouder of his pracitce than I am of my job. I have a real sure-enough man's job, and one in which I feel that I can render a service that is worth the three thousand dollars a year I am getting out of it; and as I said a moment ago, I want the cooperation and the assistance of the profession in putting this over. In some cases where I have broached the subject with members of the profession, they have said, "Oh, I am too busy; I have got too much practice, more than I can attend to." That is no excuse at all. The busier a man he is the more reason he has for taking up this work. It affords him an opportunity to get out and mingle and mix with his clientele that he otherwise would not have. You must remember that the school child, the child of today, will be your patient tomorrow, and the fact that there are not enough dentists in the

State of Tennessee today to take care of the tooth troubles is all the more reason why the tooth troubles should be prevented; and you will not be so busy, may be, that you cannot give us a little time.

I want to say that if I should write you a letter and ask you whether or not you will accept a commission as County Mouth Hygienist, I don't want you to decline it on the ground that you are too busy.

I am very much obliged to you.

RIGGS' DISEASE*

BY NEVON R. STONE, CHATTANOOGA, TENNESSEE

AUTHORITIES in general medicine and surgery have in a scientific way decided upon a certain framework for the description of any disease. Failure to adhere to this framework by dentists is one of the reasons why we have not come upon any common ground in our writing on pyorrhea. The framework used for the description of pyorrhea should be, according to Dr. Robin Adair:

First, Synonyms; *second,* Definition; *third,* Causes; *fourth,* Pathological anatomy; *fifth,* Symptoms; *sixth,* Diagnosis; *seventh,* Prognosis; *eighth,* Treatment.

SYNONYMS

Dr. Rehwinkel first called it *Pyorrhea Alveolaris* in 1877, in the city of Chicago, although the name was used in France as far back as 1870.

Many dentists prefer the term "Riggs' Disease," because the older practitioners believed that the honor for the beginning of the surgical work should be given to Dr. John M. Riggs, of Hartford, Conn., as he was the first man to advocate a treatment, or even to say that it could be cured. The same sort of sentiment prompted this naming as the calling of interstitial nephritis "Bright's Disease." In later-day nomenclature, the fault of this method of adopting names has been realized and efforts are being made to change many of them.

NOMENCLATURE

Language is a vehicle used for the transference of thoughts. It is necessary therefore that language used in scientific pursuits should be fashioned in such a way that no mistakes in the meaning are likely to occur. This fact has always been felt by scientific investigators and an effort has been made, and is constantly being made to make our language as descriptive as possible, to make our words designating an object or action or condition. Consequently our dental literature which is young, even as is *our* profession, continually makes use of some *new* word or combination of words.

This is necessary, undoubtedly, because dentistry being young and vigorous is rapidly progressing, rapidly understanding conditions hitherto but vaguely comprehended, and is finding the necessity of producing descriptive nomenclature to cope with the ever-present, newly discovered situations and conditions.

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*Read before the Tennessee State Dental Society, September, 1919.

There is no *one* tissue which immediately surrounds all parts of a tooth in the same way as we have the periosteum surrounding a bone. It is true we have pericemental tissue or dental ligament and gum tissue intimately connecting with the bone of the alveolus, and we have Nasmyth's membrane, altogether making peridental surroundings, *or* tissue. If we can *get* a term which is broad enough to include the disease or destruction of any and *all* of those tissues, and then be able by means of supplementary words or syllables to designate the disease or destruction of any one of the component parts of this peridental tissue, and also to describe different degrees and different kinds of pathological conditions referring thereto, we will have a fairly descriptive nomenclature.

By using the Greek words (*Odons*) a tooth, (*Klan*) to break, (*Peri*) around, and make of them a combination, we get the word "*Periodontoclasia*," meaning a breaking down of the tissues surrounding a tooth. This word though fairly long, is not as long as maxillary pyorrhea alveolaris, to which we have become fairly accustomed, and for *want* of a better term have perhaps used it more frequently than any other to indicate all phases of peridental disease.

If we do not desire to use periodontoclasia, exclusively, two much shorter words will convey the same meaning, and are perhaps more apt to be more universally used, viz., *Dental periclasia.*

Using the words (*Peri*), (*Odons*), and (*Logos*), we can express the study of this pathological condition as periodontology. We can speak of one who devotes his entire time to the study or treatment of it as a periodontist, one who practices periodontia. We can speak of suppurative or non-suppurative periodontoclasia or dental periclasia.

We can have acute or chronic conditions and instead of using a pyorrhea instrument in our operations, which would mean a pus-running instrument, we can have a periodontic or periodontal instrument and so on.

The use of these terms does not necessarily mean that many of the terms which we use, must become obsolete. For instance, gingivitis may be a phase in periodontoclasia, nevertheless gingivitis conveys a definite meaning to our minds and is a good term. It is possible to have a condition designated by maxillary pyorrhea alveolaris, but it is just one condition describing a phase of periodontoclasia, and can be expressed under the title suppurative periodontoclasia. There *is* a condition of periodontoclasia which seldom is described. Sometimes the bone of the alveolus wholly or partially disappears, so that the teeth and the surrounding tissues move easily on pressure, yet there is no *pus* discharged at the gingival margin and no break in the peridental tissues. This phase of periodontoclasia can be designated by the term, alveolar osteoclasm. Of course, the term, alveolar osteoclasia can be applied to a breaking down of the maxillary alveolar tissue whether accompanied by infection or not, so long as we use the proper qualifying term, suppurative or non-suppurative.

When infection has taken place and the condition is chronic, we will have an osteomyelitis which sometimes will result in necrosis of the maxillary bone and carry us beyond the realm of periodontoclasia, but in this article we are not dealing with the nomenclature of pathological conditions which are not immediately contiguous to the teeth.

There is just one other term which will be taken up in this article, namely, "tartar." This word is so often used and so seldom challenged, that one is apt to forget that it is not correct and to forget that it had its birth through a misunderstanding of the conditions which it was supposed to designate. It is generally conceded at the present time, that so-called "tartar" is a deposit principally made up of lime salts which are thrown down from the saliva, the saliva meaning the secretions of all the glands leading into the mouth and usually spoken of as mixed saliva. The aforesaid deposit therefore is more correctly spoken of as salivary calculus.

If we do not remember this fact, we are apt to speak of removing tartar from the end of a root which has had a chronic alveolar abscess on it, and also of removing tartar when we mean serumal calculus from other positions on a tooth root.

DEFINITION

Dr. G. V. Black describes it as "a *specific infectious inflammation* having its beginning in the gingiva, and accompanied with the destruction of the peridental membranes and alveolar walls," and while not committing himself, says that probably it is caused by the presence of some peculiar form of micro-organism and that it is infectious.

Dr. Rhein defines it as follows: "While pyorrhea alveolaris literally means a discharge of pus from the alveolus, the simplest definition of its *pathogenic* condition commonly accepted under the term would be, that it represents a diseased condition of the peridental region due to impaired nutrition."

Dr. D. D. Smith says, "mouth pyorrhea is a disease of uncleanliness."

Dr. W. J. Younger preferred the name pyorrhea alveolaris and gave this definition: "Pyorrhea alveolaris is characterized by an inflammation of the gums and a deposit of characteristic greenish gray or slate-colored tartar, and the wasting of the alveoli accompanied by the formation of pus and pus pockets between the tooth and alveolus; the disease is chronic in its duration, and results in the ultimate loss of the teeth.

This slate-colored incrustation of which I have spoken, I consider pathognomonic of the disease."

Dr. A. F. James in his president's address of the first meeting of the American Academy of Oral Prophylaxis and Periodontology, (Washington, D. C., November, 1914) gave the following interesting description:

"I call pyorrhea alveolaris a 'disease' but I am not able to convince myself that the word is a correct one in the sense that Riggs' Disease has, or ever will be found to have a specific organism as its source. Today, we are justified more properly in speaking of it as a condition—a condition of active fermentation which has advanced to the stage of infection and is attacking the tissues through an entrance gained at some point of irritation or abrasion of the general margin. But because we do not know the specific organism of pyorrhea, we need not distrust any of the facts which have been accumulated during the long years of our practice."

CAUSES

The etiology of pyorrhea is given as local and constitutional. A few years ago the latter was advocated by many of the leading men of the profession, and many valuable papers were published and read upon "Uric Acid Diathesis," "Rheumatism" etc., as the etiologic factor, but today those who are making the greatest success of their treatment are almost unanimous in their opinion that local causes should be decided upon as the greatest factor.

It is not denied that the general systemic condition of the patient has an influence and must be looked into and treated, but this should be considered as only a predisposing factor or complication of the pyorrhea. Personally, we believe that if a mouth is maintained in a good condition, with the absence of local causes hereafter mentioned, no systemic disorder ever would produce a case of alveolar pyorrhea. In other words, there are no systemic reasons for the cause of pyorrhea other than those which may predispose to any disease.

Younger claims that temperament has no bearing on this disease, while Smith opposes this view with the declaration that pyorrhea never develops in the purely sanguine, but always in the bilious, the lymphatic, and the nervous temperament. Impaired nutrition, heredity, constitutional disorders, excessive lime salt secretion, uric acid salts, scurvy, luxury, sedentary habits, toxic agents introduced into the system, chronic infections, and the eruptive fevers also have been named as causative agents of pyorrhea alveolaris.

In answer to those who hold the above causes Hutchinson says:

"I have no doubt that in cases where diabetes, syphilis or other serious systemic disorders are coincident with pyorrhea, the pyorrhea antedates the constitutional disorder and has been accentuated, but not caused by such disorder. If such mouths always had been under prophylactic treatment, I believe there would be no pyorrhea. The amount of tissue lost, both hard and soft, indicates that the process of destruction has covered a period of many years and could not have taken place within a comparatively short time. Usually pyorrhea in some stage exists long before it becomes manifested to either the patient or the dentist, and so the error of believing it to be of recent occurrence often is made."

The initial cause of pyorrhea is sometimes so small and simple as to be overlooked. The object of this discussion is to be of a practical value and only the causes that we positively know and see every day will be given:

First, deep interlocking cusps on bridge work, causing too great an irritation on the abutments, and setting up inflammation in the membrane supporting them, finally giving rise to pyorrheal conditions.

Second, wing bridges.

Third, bad bridge work with special reference to sanitation.

Fourth, partial dentures which may have any kind of swing on one tooth.

Fifth, ligatures, clamps and wedges in ordinary dental operations where the *contusion* of the gum margin is not treated after their removal.

Sixth, malocclusions of natural cusps, fillings, or crowns. Whether malocclusion is a cause or result of pyorrhea, there can be no doubt about its importance, no matter what the treatment may be. One of the greatest aids *is* in grinding down markedly prominent cusps and in putting out of action those teeth which are weakened by this disease.

Seventh, in the disturbance of the contact point of the teeth, whether it be from a small separation, or from malshaped points, allowing food fibers to pack in and gain a point of vantage for future destruction. A large number of pyorrhea pockets undoubtedly are formed in this way, the so-called "meat holes."

Eighth, one of the most unbearable forms of pain in the mouth is caused by the abuse of wood toothpicks. Splinters of the picks break off in the mouth and, when the patient comes for treatment, we sometimes are not able to find the cause of the inflammation. This, in time, causes loosening of the point of contact, allowing further inroads into these inflamed surfaces.

Ninth, any mechanical irritation lodged under the free margin of the gums surrounding the tooth will set up initial lesions. Shedding bristles from tooth brushes, small seeds, grit (possibly left from cleaning the teeth), skin flakes from vegetables or fruit—any one may cause this. The gum, being unable to free itself from this irritation, inflammation follows, affecting the peridental attachment and the alveolus.

Tenth, Pickerill has called attention to the ragged enamel at the junction of the crown and root of teeth. Hartzell believes this rough surface a culture bed for bacteria, and one cause for pyorrhea. Before beginning his operation, he smooths this surface with suitable files, stones, and pumice. By giving attention to this surface first, the danger of getting pumice into the pocket is not as great as if he scaled the root and then used the polishing measures on the enamel.

Eleventh, tartar formation. While it is true some cases of pyorrhea do exist where seemingly there is no deposit of tartar present, they are in such minority as to be a rare exception. Such cases may at one time have had this formation; furthermore, such minute particles can start trouble that we can not say with certainty but that all cases have some form of tartar which must be removed in our treatment. The greatest factor in the successful treatment of this condition is the finding and complete removal of tartar.

Twelfth, uncleanliness. Probably the most important and most frequent cause of pyorrhea is that at some period of the patient's life there was a lack of intelligent care of the mouth.

Thirteenth, bacterial invasion and parasites.

The bacteriology of pyorrhea. The bacteria of the mouth in a pyorrheal condition are so numerous as to kinds and variety that the bacteriologists have been unable to agree or to harmonize these difficult and complex findings. Almost all discovered bacteria may be found in some of these mouths if we examine the mouth flora of a *large* number of cases. The more choronic the pyorrheal condition the greater number, for the simple reason that they find more favorable conditions to multiply.

The micro-organisms in pyorrhea are well protected, due to the dense membrane which they inhabit, to the large amount of granulating tissue present, calculi, and the further fact that the parts here are so poorly supplied with blood vessels. The blood contains special ferments which are destructive to bacteria, but, because of the above-mentioned protection, they can't be placed into the pocket or fort held by the bacteria. If this were not the case, we probably would not have any pyorrhea infection, for it is rare where a case of primary blood infection occurs. For this reason, we must see that the only logical treatment of this disease must be to either extract the tooth, or to surgically remove this culture bed of infection.

PARASITES IN THE MOUTH AND THEIR RELATION TO PYORRHEA.

Dr. Bass says that these organisms are in greater numbers in the bottoms of the pockets and that, in this way, the bacteria are drawn into the depths of the pockets.

First, we must remember that the bacteria of the mouth are flora, of vegetable origin, like wheat or corn. These are microscopical in size. Many years ago, investigators found in the secretions of very dirty mouths, unicellular bodies, larger bodies, which were not of the flora form, but parasitic, these were given the name of *Endameba Buccalis.*

It seems to be necessary to recall to the minds of our medical friends, that the dental profession has for years been curing pyorrhea, and that *this* has been accomplished by performing the proper surgical work and after proper stimulation of the structures, and only after these procedures have we cured pyorrhea and then without regard to ameba. The method used was to remove this coat of bacteria, and then the tissues given proper stimulation, the patient has been cured of pyorrhea.

Does it have any effect on the status of *ipecac treatment* when we read that Drs. Merritt, Hartzell, Talbot, West, McCall and other distinguished investigators in the field of pyorrhea could not verify the results claimed for this treatment? A distinguished medical investigator, Rosenberger, of Jefferson Medical College, chair of bacteriology, says in Dr. Robin Adair's Book: "The *ameba buccalis* plays very little, if any part in the etiology of pyorrhea. * * *

WHAT IS TARTAR AND HOW DOES IT FORM? BY DR. ADAIR

Tartar is a concreting material, either secreted or concreted in the mouth from the saliva, which is deposited on the teeth or artificial dentures. Various hypotheses have been advanced in explanation of these deposits. We do know that the bulk is composed of calcium phosphate and carbonate, and that certain places are more liable than others to the accumulations. One theory is that the saliva holds these salts in a very unstable suspension, and, in the presence of air, carbonic acid gas is liberated and the calcium salt precipitated.

Burchard claimed that the saliva, as manufactured by the glands, is of alkaline reaction, holding in solution the salts of calcium. His theory was that in most mouths the reaction is acid and the coming together of these two opposite chemical compositions results in a precipitation which is insoluble in the acid medium.

A third theory is one of crystallization. Younger holds the view that some bacteria form a nucleus or nidus about which, layer after layer, of these salts are precipitated; especially does he believe this to be the cause of the formation of serumal calculus, the idea being that it was just the same as the crystallization of syrup starting around a thread. These theories seem to have resulted from the observation that calculus formation in other parts of the body generally contains a lump of bacteria around which they have been formed.

The fourth hypothesis is that the calcium salts are held in suspension, and when the saliva stagnates, the heavier substances collect in favored situations.

KINDS OF DEPOSITS FOUND ON THE TEETH

There are probably many variations in the character of the deposits on teeth, but the most important from a pyorrhea standpoint are as follows:

(a). Sordes is the soft, creamy, pearl gray deposit on the teeth, and differs from tartar in that it does not concrete, though it sometimes is mixed with a form of tartar and partially concreted.

(b). Granular mass, less hard than calcium sulphate. This generally is found in large quantities on the lingual sides of inferior incisors and on the buccal surfaces of the upper molars.

(c). Concretions found below the gum margin; color, light yellow to dark green. The light concretion is soft, while the dark one is hard.

(d). Serumal calculus. The red or greenish color of the second variety named is given by the escape of hematin of red blood corpuscles, due to the rupture of small blood vessels by mechanical irritation of the deposit.

Dr. G. V. Black's theory of tartar formation is that the susceptible mouth contains a material which he terms the "agglutinating substance." This substance is transparent and slightly sticky. This serves to gather and hold particles of calcium salts which are precipitated from the saliva. This gradually hardens after a few days. In his personal experiment with a slot cut in his artificial set of teeth, he advances the idea that salivary calculus may be controlled to a certain extent by the diet. Eating too much caused him to have a greater deposit, while the use of a saline cathartic would cause a cessation of deposits for a week or more.

Before the advent of prophylaxis, dentists were paying most of their respects to the hard deposits as the principal factor in dental lesions, but recently we believe this to be a mistaken idea, and that the soft deposits are more vicious in their action on the soft tissues. In fact, upon the removal of large quantities of tartar from the teeth, we frequently find the tooth in a well-preserved state, and the gums comparatively healthy, but we never find this to be the case when the sordes or soft deposits are removed, because the latter contain a greater amount of infection; we sometimes find the tooth in a leathery condition and the soft tissues always in a state of inflammation.

PATHOLOGY OF PYORRHEA ALVEOLARIS

The pathology of dentistry should be considered in the same manner as the pathology of surgical diseases. In dentistry the attempt to bring up a different pathology has been due to a lack of proper knowledge and observation.

In taking up the work of pyorrhea, the dentist must have an accurate knowledge of normal conditions in order to be able to detect a deviation therefrom. Also, a complete knowledge of the histology of the gums, teeth and maxilla is imperative. First should be noted the appearance and color of the normal gum. We will note that there is no tumefaction of the gum margin; also that the gum margin clings to the teeth at the enamel margin, completely surrounding the tooth at the insertion into the bone.

The teeth most often affected by pyorrhea seem to be the lower incisors. Next in the order of frequency, the superior molars and bicuspids, then the inferior molars and bicuspids, the superior incisors, lastly, the upper cuspids.

RECESSION AND CONGESTION OF THE GUMS

Recession of the gums is not necessarily a feature of the pathology of pyorrhea, although some medical men and many of the laity have, at times, mistaken the recession of the gums, especially on the upper cuspids, for pyorrhea. This recession is the result of not receiving circulation enough to keep up peridental life, and a constant diminution of the thickness of the alveolus and the hardness of the cementum. This structure either moulds into the dentin or recedes towards the root when conditions are abnormal.

The recession of the gums at the cervical margin brings most patients to the dentist for the treatment of pyorrhea. At this stage we find the peridental membrane either exposed or destroyed in part, forming a hot-bed for the culture of bacteria which continue their action in destroying the alveolus and inflaming the periosteum. This recession is caused by the falling in, as it were, of the supporting structures.

The best, and only proper time to begin treatment is during the existence of what he called "gingivitis." When we can get a case in hand when the gum is red and the tissues slightly swollen, we are absolutely sure that we can cure the case. Woe to the dentist who sees this condition and lets the patient run along from bad to worse! He may soon have a case that is not only beyond his control, but is beyond the control of the specialist also. So we must say that the operator who is curing gingivitis is doing the best pyorrhea work.

Probably one of the most constant diagnostic points in pyorrhea is the tumefaction of the gum tissues. The extent of this tumefaction may be from a few lines in width at the gum margin to a heavy roll of tissue extending the full breadth of the roots of the teeth. This tumefactory condition may be hard and firm, and when this is the case, the color of the tissue will be a light lilac, or, if the pocket beneath be extensive, of purplish tint. However, this tissue may present a very different clinical picture in that the tissue may be very soft and fluffy, bleeding upon slight irritation, as in brushing the teeth.

When the patients are about to be dismissed after treatment, they often call attention to the fact that their gums have receded more than they did previous to treatment. This seems to them a most serious question, and the dentist should be very careful to convince the patients that such recession always follows a correct treatment, because of a reduction of the inflammation and a return of the gum to its natural thickness. In addition to this, the alveolus surrounding the teeth is now much less than before disease, or, having been removed in the surgical work, gives the gum covering it the opportunity to fall further away from the crown of the tooth.

This recession if extensive, may, in the future, cause trouble, for the reason that the flap of gum tissue which normally protected the interproximal space from food impactions may be too low to protect this space against further inflammation and infection from packing. It must be well understood that in these cases the patient should present at frequent intervals and have such spaces cleaned by their dentist.

THE PERIDENTAL MEMBRANE

The object of the peridental membrane is to transmit nourishment to the teeth and to furnish elasticity and a cushion under force, or a sling in which the teeth are held.

Dentists have been taught that the peridental membrane partook more of the character of a periosteum, but later investigators claim this structure to be a true alveolar-dental ligament. Miscroscopical examination reveals solid bundles of fibers of Sharpey which extend from the tooth out into the alveolar process. The insertion is about the same as ligamentous insertion into bone in other parts of the body. These fibres of Sharpey, according to several authorities, form circular rings which suspend the tooth in its socket.

The peridental membrane has for one of its purposes the nutrition of the cementum. This membrane may be separated from the tooth or completely absorbed at the time of the first injury, be it tartar, bad dentistry or infection.

Healthy, strong teeth often are exfoliated from the alveolus because of hypernutrition, which results in deposits in the substance of this membrane making it resemble the cementum, or the membrane may be so feeble in its function as to shut off nutrition with like result. Cases of loose teeth from this cause frequently have been diagnosed pyorrhea.

FORMATION OF PUS POCKETS

The result of irritation to the gingival tissues produces an exudation in the gum tissue. This exudate becomes septic through the action of the bacteria of the mouth, forming pus; suppuration destroys the adjacent alveolus, forming the so-called "pockets."

In the early stages, the extent or depth of a pocket on the tooth root is indicated by a reddish area on the gum. As the disease progresses and becomes chronic the color changes to a purplish hue. The color of the pus from the reddish area is yellow; that from the chronic or old standing is mixed with stagnant blood and is dark blue, purplish or black in color.

Black has said that the human teeth bear something like seventeen hundred pounds of pressure each day. If we will liken a tooth in its socket to a piston working under a heavy load, we will see how easy it is for bacteria and its products to be forced into the broken blood vessels found here and the cancellous structure of the jaw bone. Estimating the infected surface of a pyorrhea case, we are surprised to find its extent from three to seven square inches. In addition to this, if we will compute the quantity of pus and other poisonous products excreted and swallowed daily by the average case of pyorrhea, something like a half teaspoonful will be a safe average. The wonder of it all is that nature can provide immunity against such odds.

ALVEOLAR ABSCESS IN PYORRHEA

A narrow constricted pocket may become suddenly very active, or the exit from any pocket may become blocked to form a pyorrheal alveolar abscess. The swelling may have some of the appearances of the ordinary alveolar abscess from a decomposed pulp, and often is mistaken for such.

SYMPTOMS

As we said in the definition of pyorrhea, it is of slow onset. So slow is it that a patient may have it for years and be unaware of his condition until a dentist tells him of it. On the other hand, it is a sleeping volcano, liable to break out at any time. Suddenly, some day the gums begin to swell and the volcano breaks forth with an alveolar abscess. You will find that in the incipient stage the patient stops brushing his teeth because the gums are painful and bleed. In the latter stages you will find the exudation of pus and the teeth becoming loose.

The symptoms are sometimes so mild that it is difficult to diagnose the condition until you have made a thorough examination.

To know the early signs of the disease one must be very familiar with them and always make a careful probing examination. The patient may have had pyorrhea before he got into the habit of brushing his teeth, so that when he comes to you his teeth may be in a clean condition, thus somewhat covering up the septic picture and deceiving the examiner.

A rather common symptom of advanced pyorrhea is a separation of the teeth destroying the contact points and giving entrance for food impaction. The peculiarity of this separation is that the affected tooth bears away from the point of infection or pocket.

One of the most constant symptoms of pyorrhea is the odor coming from the pus, which is similar to that from a diseased antrum. You instantly detect this odor as soon as the patient opens his mouth, and you will soon learn to know it. The odor is characteristic.

The duration of pyorrhea is very uncertain. The incipient form, so-called gingivitis, may run along many years before developing into the more severe types. When an infection of long standing does begin to make inroads into deeper structure, the progress of the disease is very rapid. There are many factors as to health, local mouth conditions and character of infection or inflammation which affect the duration.

Individuals who have healthy mouths and who ordinarily give proper regard to dental toilet may for some cause, such as sickness or severe grief, entirely omit any care of their mouths. This lowering of vital resistance together with the omission of cleaning the mouth will produce a pyorrheal condition giving a history of rapid development. In so short a time as thirty days such a case may exhibit bleeding gums, pus, and loosened teeth.

DIAGNOSIS

Dr. Younger has written that "fully ninety-five per cent. of the Anglo-Saxon race have pyorrhea in some stage of development in one or more of the alveoli. It is common among all races, in all countries, and among all classes. The rich and the poor, the well conditioned and the mean, the vegetarian and the meat eater, the fat and the lean, the robust and the debilitated, the strong and the weak are all affected. Neither does temperament seem to produce immunity, for the nervous, the sanguine, and the phlegmatic suffer from it."

The use of the X-ray as a means of diagnosis in cases of pyorrhea alveolaris is quite as essential, quite as valuable, as in any other field of dentistry.

That the X-ray is an infallible guide must not be entertained for a minute, but all symptoms, signs and hints, taken in conjunction with the radiographic examination, will make the diagnosis more clear and positive.

The most apparent use to which the X-ray may be applied is to find out the amount of bone destruction or absorption about the roots of the teeth afflicted with Riggs' Disease. Instrumental examination is about as exact and certain as the complete filling of root canals without a radiograph. How certain that is, may be judged from the fact that less than five per cent. of the roots into which root-canal fillings are placed reach the apex.

The radiograph will not only show the amount of absorption of the alveolar bone, but will, within certain limits, show the state of the attachment between the alveolar bone and the tooth. It will also show the length of the root and the amount of leverage it may stand.

The most common mistake made by those who treat Riggs' Disease without using the radiograph is that of treating chronic alveolar abscesses for Riggs' Disease. The number of cases in which chronic alveolar abscesses discharge their pathological contents between the proximal surface of teeth is exceedingly great. And this simulates Riggs' Disease so closely that it is a continual puzzle to those who treat this disease why such teeth fail to respond to treatment. This condition of affairs is not confined to the anterior teeth or bicuspids, but also includes the upper and lower molars.

The presence of undiscovered blind abscesses is also another condition that confuses both the diagnosis and the treatment of Riggs' Disease. Such teeth having lowered both the systemic and local resistance, the efforts of the dentist to restore normal tooth function and overcome the general infection, supposedly due solely to the Riggs' Disease, are defeated and nullified by the constant and insidious infection produced by these apical abscesses. This suggests that any teeth to which are attached caps, crowns or bridge work, or any devitalized teeth should be subjected to radiographic examination prior to treatment.

Since the treatment of Riggs' Disease resolves itself into a re-organization of the mouth, and an attempt to restore function to as near normal as possible, the employment of the radiograph will be found to be the most valuable and trustworthy guide we have to help attain this end. It is a continual surprise and wonder to those who now use this agent as a diagnostic help to find those unsuspected and strange conditions which only the radiograph or autopsy could reveal.

At first thought, we have such confidence in our ability to see with our eyes and feel with our fingers that the X-ray seems unnecessary. But even the most expert fail to find, and often overlook, what the X-ray does find. The greater experience one has had with the X-ray, the more convinced one becomes that one's ability to discover by any other means the conditions that the radiograph reveals is greatly overestimated.

It is only necessary to name some of the things which, in the treatment of Riggs' Disease, have been overlooked by the eye and the instrument! For example, pieces of toothpick, gutta percha, amalgam and cement pushed up between teeth, broaches, bits of broken instruments, ligatures, and rubber dams have been found; perforated roots with the post of a porcelain crown sticking out, lost or forgotten roots and impacted teeth causing chronic and persistent irritation.

Often, with all conditions quite right, as the tube, exposure and angle of the rays, it is possible to find deposits on the roots and pulp stones in the canal.

It is quite advisable, if not necessary, to have a radiographic examination before beginning treatment as part of the diagnosis. It is also well, after the treatment is completed, to again examine with the X-ray as a matter of record. After a year or two it is quite interesting to again examine with the X-ray to find out if regeneration of the bone has taken place.

The question as to the curability of a given case is one which depends a good deal on the individual skill of the dentist. A case may be incurable in the hands of one practitioner and easily cured by another, who is more skillful in the removal of pyorrheal conditions.

By proper treatment, pyorrheal conditions can be healed, the tumefaction of the gums and soreness of the teeth can be made to disappear. The shedding of the teeth, flow of pus, elongation of the teeth, recession of the gums, carious action in the bone and its resulting odor can be obliterated. These are the benefits to be derived from the treatment of diseased gums. Not only this, but we also can prevent other teeth in the same mouth from becoming infected.

The dental profession has been responsible for the loss of thousands of teeth just because so many dentists have told their patients that there is no cure for pyorrhea. If dentists have such large practices that they do not care to take time for the treatment of these cases, it is well for them to know that other men in the profession are making a success of this work, and that from seventy-five to eighty-five per cent. of all cases of pyorrhea are being cured and stay cured under the care of these operators.

When we find the tooth which can be raised up and down in its socket we are led to believe that there is little life in the membrane surrounding the tooth, and that the terminal end is covered with spicules and burr-like projections. When such teeth are extracted, their ends resemble a log on which barnacles have collected. Other conditions might produce this loosening of the ligamentous attachment, as when the tissues at the apex of the socket have become so infected that the ends of the root undergo a process of absorption similar to the absorption of the temporary tooth. If either one of these conditions can be diagnosed beforehand, we can say with absolute certainty that the tooth cannot be saved.

Dr. Riggs, of Hartford, is generally credited with being the first American to use instruments in the treatment of pyorrhea. The instruments he used were very large and crude. Some of his original shapes are still to be found in the supply houses.

Probably the best general class of instruments for this work will be those which are used with a push and those used with a pull motion.

Dr. Towner believes in the file type of instrument and gives his reasons in the following quotation from the book published by Dr. Robin Adair:

"The use of the file in the surgical treatment of pyorrhea alveolaris, and kindred diseases, seems to be productive of more definite results than any instrument suggested. It is the most sensitive, accurate and delicate instrument yet devised. By its use one is enabled to develop a remarkable tactile sense, thereby being able to judge the condition of hidden surfaces, remove deposits, and polish surfaces treated with an unusual degree of accuracy. These instruments have an advantage which seldom is recognized in that the edges of the blades are serrated, thereby permitting their use as positive working points in constricted bifurcated areas. They are delicate in that they clog and become dull sooner than other instruments, but the extra care necessary to keep them clean and sharp is more than compensated for in the favorable results attending their use."

TREATMENT

When it comes to such work as prophylaxis and pyorrhea, it is fully as important as in any other surgical work to use absolutely sterile instruments.

Cleanse field of operation by using peroxid of hydrogen, iodin and aconite, or sprays of any antiseptic you prefer to use. Remove calculus deposited upon root surfaces of as many teeth as the case justifies. If in the incipient stage a complete canvass could be made. Never treat a case more than one hour at one sitting.

The surgical part is not complete upon the removal of deposits, but after that, these surfaces should be smoothed and polished as perfectly as may be. Then comes the removal of all loosened detritus, with the hot water used in a strong force syringe with slender points which will reach well down into the pockets; these points are usually of silver or German silver.

If the operation is well done it is inadvisable to disturb the pockets which are soon filled with plasma out of which repair comes. The common practice of frequent probing and medicating is strongly condemned.

Some operators find it is necessary to remove cancellous bone by the use of burring or curetting.

If suppuration continues after curetting, Dr. Kelsey recommends the use of phenol-sulphonic acid to be applied with a small, pointed, wood applicator.

The blood clot filling the pocket prevents it from becoming infected and acts as a matrix for new granulations to fill the pocket healing tight around the tooth root. According to the research of Macewin, of Glasgow, new bone will be thrown out by the osteoblasts at the margin of the freshened alveolar process and the tooth will be much firmer in its socket.

Cocain often is used to inject into the pockets with a blunt needle to enable the operator to work with less pain.

In working on the lower jaw, Dr. Robin Adair advises the use of the saliva ejector, using a compressed air syringe. The air distends the gum from the tooth so that with the mirror the operator can see and remove the smaller deposits which, when dry, show up much better than when in a moist condition.

Silver nitrate is a good agent to use when the gum remains flabby, and in cases where the roots of the teeth are exposed and sensitive.

In cases in the multirooted teeth where the bifurcation is exposed, Dr. Smith suggests making a positive retention cavity between the roots and filling—this with hard gutta percha, forcing it, while soft, against the process and gums and finishing it flush with the tooth. He says that this will arrest all recession at this location. Copper cement also gives excellent results.

Treatment by emetin has been used extensively, subcutaneously and also in the pyorrhea pockets by many specialists, but I believe this treatment gradually is being eliminated.

Hamilton National Bank Bldg.

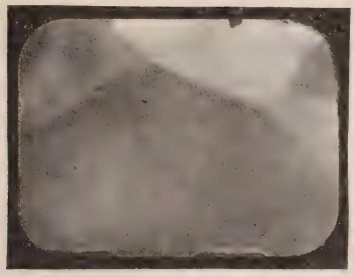
WHAT WOULD YOU DO?

BY DR. P. S. COLEMAN, WILBURTON, OKLAHOMA

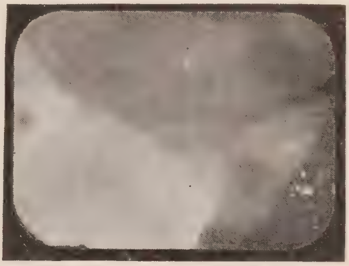
In our practice it is absolutely necessary that we use about ninety per cent. of hard common sense and about ten per cent. of "know how." We often are better able to serve our patients by not performing certain operations than by performing them; and then again we often get up against the proposition of not knowing what we really should do. To illustrate: A man once rushed up to a doctor's office and demanded that the doctor come immediately and be in a great hurry to get there, and when the doctor took matters calmly, didn't hurry and make any special effort toward haste, became very angry, and began to swear at the doctor, who took it all very mildly for a while, and when the caller became too obnoxious finally turned around upon him very suddenly and remarked, "I wish to h——— you would shut up; I'll get there now before I know what to do."

Case No. 1

Case No. 1: Eight years ago this lady had two upper molars extracted. Inside of two weeks she completely lost the sight of an eye and hearing in an ear. Thinking perhaps she might have a stray wisdom tooth, I X-rayed the head from all four sections, also two small plates from inside mouth, but found nothing there. Bicuspid, as illustrated, shows some trouble. Now the other side is affected by the two molars opposite. She doesn't want any extractions or treatments for she is afraid she will lose the remaining eye and ear; but is suffering badly and wants something done. Just exactly what would you do? Of course I can sidestep it and tell of some famous dental surgeon away over in another section of the state, but we are more and more getting up against new situations which we, as dentists, must handle and handle intelligently if we are to fulfill our full mission here upon earth.



Bicuspid Section



Malar view shows peculiar V-shaped shadow

Case No. 1

Case No. 2: Lady called for extraction of two badly-infected upper centrals. She was in a high state of nervousness and unstrung. The extractions were simple, but, as her father was with her and exhibited a like state of nerves, I wondered what was wrong, and was not long in finding out. Brother Nerve Block seemed to be at the bottom of the mystery; and she told me that just a year previously her mother had gone to her dentist to have the upper centrals removed, and that the dentist had stuck a long needle in the roof of her mouth and blocked the nerves and likewise extracted her teeth, all done painlessly; but inside of two days her whole body began to swell, including face. Later she turned black and purple all over, and died within a very few days; and so you could hardly wonder that this visit to my office was fraught with many misgivings upon the part of the patient; and the point I desire to make is simply this: Before you block nerves be *sure your solution is right* and the field of operation clean, and don't block every nerve your fancy wills. It's all very nice to do the operation, and you may do it ten thousand times without any very serious trouble; but when an ordinary infiltration will answer nicely, *let the nerve alone.* In the lower jaw it is almost indispensable, but we have many uneasy spells from that section, and a deep infection is always a long, awful story; and if by any reason you suspect pus in the area you intend to inject, use a bit of the ninety per cent. common sense and don't do it—keep away from the doubtful things even if you have to hurt a bit; or better still, nothing like being a master of several methods and using them all as your mind dictates. Conductive, nitrous oxid and infiltration will answer all ordinary requirements.

THE GOLD SHELL CROWN

BY DR. MORRIS MESTEL, NEW YORK CITY

Under the title "Cementing on a Bridge" by Dr. Frank W. Sage, in THE DENTAL SUMMARY, December, 1919, the author incidently mentions and credits Dr. Richmond as the inventor of the gold shell crown.

Like many other members of the profession, I perhaps might have overlooked this little and no doubt innocent misstatement, were it not for the fact that this has since been quoted in the *Cosmos* for February, 1920, and the misstatement deserves correction.

Dr. Richmond was not the inventor of the gold shell crown.

The gold shell crown was patented by Dr. Beers, in 1873, although Dr. W. H. Morrison claimed to have performed the same operation as early as 1869, a published description of it having appeared in the *Missouri Dental Journal*, in May of that year [1].

It might not be out of place to mention, that the shell crown under discussion is not of a recent origin.

Mouton, of Paris, in 1746, mentions that gold crowns for anterior teeth are in bad taste, and should be enamelled [2], [3].

Give credit where credit is due.

Dr. Wm. Jarvie, of Brooklyn, in his "Reminiscences and Experiences" in the *Journal* of the Allied Dental Societies, March, 1914, has a similar misstatement.

140 West Forty-Second Street.

[1] *Dental Brief*, July, 1905, Question 374.

[2] *History of Dentistry*, (*Guerini*).

[3] *History of Medicine*, (*Garrison*).

OUR PROFESSIONAL LINGO

BY H. W. ALLWINE, M.E.,M.A., D.D.S., OMAHA, NEB.

Usually, when one writes for publication, he thinks he has some thoughts that seem good to him, and he wants the other fellow to know of them. I have nothing to offer. I want the other fellow to tell me.

In the use of professional terms, it seems to me we are very verbose. I want to know why we have in use so many terms meaning the same thing, and why we are so ready to mix the Latin and Greek in our derivations? It is long since I laid aside my etymology, and may have the rules for coining words a little mixed; but when I read my journals and study recent publications, and see such a great variety of terms to convey the same idea, as the naming of radiographic work and the naming of specialist's, it don't look good to me.

As we are a young profession, would it not savor of good taste to avoid promiscuous use of terms and methods of coining them? Are we not too ready to accept and adopt "any old term" that is put into print?

The old family name, dentist, is from the Latin, "dens," a tooth. It naturally would seem that all offspring would take the family name.

When I went to college, we learned to regulate teeth. This work is now being done by specialists. This first child names itself, and takes the name "Orthodontist." Being of Greek origin, you naturally would look for Greek parentage. If a white mother were to present her white husband with a black child, he might well wonder where she had been. So with this child, "Orthodontist." Why of Greek origin, having Latin parentage? Why dontist? Why not from dens, the family name? Why not call him regulodentist? "Regulo," I regulate; "dens," a tooth; "ist," one who. Hence, regulodentist, one who regulates a tooth or teeth. Is it not consistent?

Behold! Another Greek child is born of Latin parentage. This sprightly lad calls himself "Exodontist." I wonder why this Greek name; his daddy's name is Latin, "dens." Why not give the kid a Latin name? His business is to take out teeth; hence why not call him "Extradentist? "Ex," out; "dens," a tooth; "traho," I draw. The name conveys the thought, "I draw out a tooth." Would not Regulodentist and Extradentist be appropriate names for these kids?

But for all the promiscuous use, the interchangable use, mixed derivation, and no derivation at all, and great verbosity, the terms used to mean radiography, have them all skinned. We boast of our acquirements, of our professional standing, etc., but it would seem some of our *ass*-pirations would lead us into the ludicrous. Every John Henry has the personal right to coin any word he desires, but an intellegent body of men and women is not obliged to use it.

When Wilhelm Konrad Von Roentgen learned how to look into the human body, he rendered to humanity a service beyond our ability to fully appreciate as yet. Its benefits are incalculable and immeasurable. We all throw up our hats to this scientist. But when we thus honor him, we go daffy. This thing must have a name; some chose to name it after the discoverer, Roentgen. Does this mean anything? Would it not be better to use a word that conveys the idea of the act that takes place? I ask, whether, as a profession we should adopt this word. It would seem many are not satisfied with it, judging from the use of other terms in our journals and professional works. So we have "radiograph," "radiogram," "X-ray," "skiagram," "skiagraph," "roentgenograph," "roentgen," *ad infinitum*, with all their concomitants.

I would ask, too, why "radiodontia," for the same reason as above? I see no reason for uniting Latin and Greek origins, when Latin alone will do as well. "Radius," a ray, a picture; "dens," a tooth; and "tia," the act of—the act of making a picture of a tooth.

Just recently I purchased two works; one used the term "radiograph" throughout, while the other used nearly all the above, and threw in for good measure, "stereoroentgenography." Could we not lop off half of this, and yet have a better word? A word that the ordinary individual could spell and pronounce? Surely our verbosity seems humorous and ludicrous.

Reader, what do you think of it?

You may say, "Well, Allwine, what are you going to do about it?" It always is easy to find fault, but not always easy to suggest better ways of doing a thing. I am inquiring for knowledge. I would ask if it would not be better to have the National society name good men, who can coin words as well as they can make coin, to pass on the adoption of important words? Would it not give us uniformity and avoid the use of so many words meaning the same thing, and the adoption of terms and names the origin of which is questionable under existing circumstances?

412 Securities Bldg.

Whoopee!!
—and then some

The Northern Ohio Dental Association will pull off another of those great meetings of theirs—*five days, choke full—*

June 7, 8, 9, 10 and 11
Hotel Statler, Cleveland

Two ½ full days Convention Work—Three ½ full days Post Graduate Courses

Pyorrhea, Thos. B. Hartzell
Safe and Sane Dentistry, Percy R. Howe
Partial Dentures, G. Walter Ditmar
Crown and Bridge, R. W. Knapp
Full Dentures, W. S. Heermans

—You know them all!

Keep your ear to the ground—Make hotel reservations now

CORRESPONDENCE

A PROPOSED EXCISE TAX OF $10 PER OUNCE ON GOLD

BY HOMER C. BROWN, D.D.S., COLUMBUS, OHIO
Chairman Legislative Committee, N. D. A.

Congressman Louis T. McFadden, of Canton, Pa., recently introduced in Congress a Bill known as H. R. No. 13201, providing for an excise tax of ten dollars per ounce on all gold, except that used for monetary purposes and for some limited dental purposes, such as Governmental and free clinic uses, and also for corrective and restorative dental work for children under fifteen years.

This legislation is sponsored by the American Mining Congress and is supposed to be approved, if not strongly supported, by the banking interests of the country. Its alleged purpose is to stimulate an increased gold production, and there may be some very good arguments for offering some additional incentive to the gold mining industry, in order to produce the required amount of this very important and necessary metal. This tax is to be distributed as a premium or a bonus to the producers of new gold on a basis of ten dollars for each ounce mined. However, unless all gold used in any way to correct physical defects is exempted from the provisions of this Bill, the destructive results, both from a humanitarian and an economic standpoint, will be so far-reaching as to more than counter-balance any constructive benefits wherein economics and the mining industry are only considered.

The teeth rank first, and the eyes usually second, in any classification of physical defects. The importance and necessity of correcting defective vision has long been recognized, but in only recent years has the importance of neglected mouth conditions, as a positive contributing factor in disease, been generally recognized. As a result, many industrial institutions are recognizing the individual unit as an asset and have established both medical and dental clinics in order to conserve health, promote efficiency and increase production. Therefore, if Congress enacts legislation which will in any way tend to restrict the benefits accruing from the correction of such dental and eye defects the far-reaching influence, in the final analysis, will be destructive rather than constructive. The correction of these defects is fundamentally a constructive service and can not in any sense be considered as a luxury. Thus the best interest of society, in its broadest sense will be served by recognizing the merit of such an exemption and this also will tend to stimulate an increased interest in health conservation.

Another very objectionable Bill is pending in Congress, introduced by Congressman Isaac Bacharach, of Atlantic City, N. J., and known as H. R. 7785. This Bill provides for a greatly-increased duty on surgical and dental instruments and artificial teeth, and it passed the House August 2, 1919. The Senate Finance Committee reported this to the Senate March 2, 1920, without amendments. All such added expense becomes a fixed overhead and naturally must be distributed to a long suffering public, whose burdens are already sufficiently oppressive. Therefore, this becomes more than a dentist's problem, and protests from the public would be voiced if fully advised of the situation.

In view of the foregoing, I urgently request that each reader promptly write his Congressman emphasizing the importance of exempting from the provisions of H. R. 13201 all gold used in any way to correct physical defects. Also, promptly write his Senators requesting them to oppose the increased duty on surgical and dental instruments and artificial teeth. Then discuss this proposed legislation with some of your influential patients and secure their cooperation.

H. R. 13201 is before the Ways and Means Committee of the House of Representatives, and I append hereto a full list of the personnel of said committee. It is especially important that these committeemen be communicated with and the officers of any dental organization will be fully justified in promptly speaking for their members, since time is an important factor.

WAYS AND MEANS COMMITTEE

Joseph W. Fordney, *Chairman*, Mich.; J. Hampton Moore, Pa.; William R. Green, Iowa; Nicholas Longworth, Ohio; Willis C. Hawley, Ore.; Allen T. Treadway, Mass.; Ira C. Copley, Ill.; Luther W. Mott, N. Y.; George M. Young, N. Dak.; James A. Frear, Wis.; John Q. Tilson, Conn.; Isaac Bacharach, N. J.; Lindley H. Hadley, Wash.; Charles B. Timberlake, Colo.; George M. Bowers, W. Va.; Claude Kitchin, N. C.; Henry T. Rainey, Ill.; Cordell Hull, Tenn.; John N. Garner, Texas; James W. Collier, Miss.; Clement C. Dickinson, Mo.; William A. Oldfield, Ark.; Charles R. Crisp, Ga.; John F. Carew, N. Y.; Whitmell P. Martin, La.

609 Hartman Building.
April 19, 1920.

Preparedness League of American Dentists

Report of French-Belgian Fund

The accompanying letter from Dr. P. Fontanel, *Treasurer* of La Aide Confraternelle, Paris, France, has suggested the thought that a great work might be accomplished by our National, State and Component societies by adopting, as it were, a few of the orphans of our unfortunate brother dentists and supplying means for their education and support. A separate fund could be devised by each society entertaining this great object, or the sum required taken from the general treasury. A sum not to exceed five hundred dollars each year would, doubtless, be sufficient. Surely this plan would prove a source of constant interest and satisfaction to every member of our profession participating therein and also provides a definite purpose for our efforts.

Will not the secretaries of the various societies immediately communicate with the president of the League who will gladly outline the plan? You will recall that many of the organizations and independent groups of men throughout the country adopted many Armenian orphans in this way. Should we not use the same means to aid the children of our departed brother dentists? Let us be, not alone, brothers in spirit, but fathers in deed. We implore you to write *Now* to,

J. W. Beach, *Pres.* P. L. A. D.,
131 Allen street, Buffalo, N. Y.

Paris Le 20 Fevier, 1920.

My Dear Doctor:

Doctor Davenport has handed to us the cheque of two thousand dollars, which you kindly forwarded to him as first installment of the Preparedness League.

The acknowledgment of such a generous gift has been entrusted to me and I beg to accept the thanks of all our Colleagues and the chief members of the Committee of "Aide Confraternalle."

I see that you inquired from Doctor Davenport what use we made of the money. I must state at once that our aim is twofold.

First, we help those of our fellow dentists whose connections have been lost because the towns they lived in were destroyed. After years of service during the war, they came back to homes which are heaps of ruins and find no work to do in a deserted town.

They are compelled to begin life anew, they must buy again the necessary apparatus and settle in new places where work is hard to get, because they are strangers.

We felt we ought to help them and do so by giving, or lending without interest, rather large sums. We have in the last six weeks paid out ten thousand francs for this purpose. Now we have also another aim, still more important in our eyes, we want to help our orphans.

I think how many wives, whose husbands had gone to the front, have remained in an impoverished home, the surgery being closed, waiting for his return, and waiting in vain.

They have not the wherewithal to live and yet there are children to be brought up.

The Committee of "Aide Confraternalle" have thought that a proper feeling for the dignity of our profession made it imperative to them to bring up and educate those orphans as their fathers would have done.

We must be able then to give each at least one hundred francs monthly until they are of age. You must be aware that such a sum will only cover very modest expenses, as school also is to be paid out of it.

And yet, we needs must have two hundred thousand francs to do it, and if we wish to help the mothers as well, another one hundred and fifty thousand francs are necessary.

We are far from being able to meet such expenses; since we have now only one hundred thousand francs left, thirty-five thousand francs having been spent in relieving some of the most distressing cases; what remains must be devoted to the help of those of our colleagues whose homes have been destroyed.

We have therefore thirty-five thousand francs short of our wants. So long as we do not possess such a sum, we cannot promise our orphans an annuity, and tell the mothers not to fret, that we have secured the children's livelihood until they are of age.

Now, my dear colleague, you know our aims and needs; you are acquainted with the use we make of the funds you send us; for the sake of the solidarity which is so strong a tie among the members of our profession, do go on with your propaganda for our orphans, and if you can, send in thousands of dollars.

We do indeed get fresh subscriptions in France nearly every day, but they are small, for every French dentist has had to suffer from the war and is in much reduced circumstances.

We duly invite to our meetings your two delegates, Doctors Davenport and Burkhardt, and let them hear whatever we do. In future we shall give them accurate memoranda so as to allow them to give you every detail concerning our doings.

Believe in our gratitude for the help you have been able so far, to afford us, and please give a hearty message from us all to the members of the Preparedness League.

We remain, dear Doctor, yours very truly,

P. Fontanel, *Tresorier* la rue. Vercingetorix, Paris. P. FONTANEL, (*Signed*).

DR. L. M. WAUGH,
Treas. of the League of American Dentists, 576 Fifth avenue, New York.

My dear Doctor: I am in receipt of your favor of January 2nd, with draft on Credit Lyonnais for the amount of twenty-one thousand, six hundred and ninty-eight francs, which will be turned over to our committee for the relief of French and Belgian dentists, and you will receive a receipt from them in due time.

This kind act on the part of our Colleagues, the dentists of America, will be far reaching I can assure you.

We will keep you posted from time to time, the use to which our funds are being put.

The demands of our Paris committee are very extensive, and your suggestion of further remittances gives us great encouragement.

Every sincerely and fraternally yours,

WILLIAM SLOCUM DAVENPORT (*Signed*).

EDITORIAL

DENTAL HYGIENISTS

Dental hygienists are gaining in popularity. No less than twelve states have passed laws legalizing the dental hygienist, and similar bills have been introduced in the legislatures of a number of other states during the past winter.

New York state, in 1916, enacted the first law permitting the licensing and registration of dental hygienists.

Regarding the duties of these hygienists this act states:

> "Any licensed dentist, public institution or school authority may employ such licensed and registered dental hygienists. Such dental hygienists may remove lime deposits, accretions and stains from the exposed surfaces of the teeth, but shall not perform any other operation on the teeth or tissues of the mouth. They may operate in the office of any licensed dentist, or in any public institution or in the schools under the general direction or supervision of a licensed dentist, but nothing herein shall be construed as authorizing any dental hygienist performing any operation in the mouth without supervision. The regents may revoke the license of any licensed dentist who shall permit any dental hygienist operating under his supervision to perform any operation other than that permitted under the provisions of this section, and they may also revoke the license of any dental hygienist violating the provisions of this act."

Laws already passed in other states are similar to this in their requirements. Minnesota, however, gives the dental hygienist the privilege, also, of administering anesthetics as applied in dentistry.

The New York law was enacted in 1916; that of Iowa, Massachusetts, and Connecticut in 1917; Maine, 1918; Michigan, Minnesota, Tennessee, Oklahoma, Colorado, New Hampshire and Alabama in 1919.

Already the hygienists have begun to organize. The Dental Hygienists of California, an association of graduate dental hygienists was formed in San Francisco in March, 1920. The object of the new society is the furtherance of the oral hygiene campaign, and to broaden the education of the hygienist. Mrs. A. O. Wright, of Oakland, graduate from the University of California as Dental Hygienist, was elected president of the association; Miss Elma Platt, of San Francisco, a Forsyth graduate, was selected as vice-president; Miss Helen Prosser, San Francisco, Dental Hygiene graduate of California, treasurer; Miss Charlotte Greenwood, San Francisco, a Forsyth graduate, secretary.

There seems to be little doubt of the usefulness of the dental hygienist in the schools and public institutions, and yet the dental profession is divided as to the advisability of the enactment of legislation legalizing the dental hygienist, and it will be interesting to watch the outcome in those states where laws already have been passed.

"FUNDAMENTALS OF OPERATIVE DENTISTRY"

Under this title, Dr. W. H. O. McGehee, Director Dental School, Western Reserve University, is writing a book to be published by The Ransom & Randolph Co. early in the fall. Chapters from the book are to be printed each month in The Dental Summary until the book is published. The opening chapters appear in this number. Readers will recognize the importance of such a work and there should be a large pre-publication subscription list. Subscriptions will be received by Dr. McGehee or by The Dental Summary. Price can not be named at this time, but it will be made as low as net cost will permit.

OBITUARY

Dr. J. R. McGinnis

Dr. J. R. McGinnis, Summerfield, Ohio, aged 71 years, one of the best known dentists in southeastern Ohio, died Saturday afternoon, March 19, after a lingering illness from a complication of diseases.

When but a young boy he answered his country's call and was a member of Co. I, 161st Regiment O. V. I., under Captain Wm. Allen, and after his discharge from the service re-enlisted in Co. D, 185th Regiment, under Captain Rodecker. He was a member of the M. E. church, a member of the John Brown Post, G. A. R., and an active, untiring worker in all their ceremonies. The last few months of his illness was fraught with much suffering and he had often expressed himself as being ready to go.

He is survived by his wife, one daughter, Mrs. J. W. Amos, of Belmont, one son, Dr. J. G., who has been a partner with his father in the dental business for a humber of years, two grandchildren, Martha Amos, of Belmont, and Harold McGinnis, of Summerfield, one brother, Judge J. M. McGinnis, of Caldwell, one sister, Miss Anna of Summerfield, and one step-sister, Mrs. George McGuire, of Owaneco, Ill.

OHIO STATE SOCIETY

Notice to Members: Copies of the revised Constitution and By-Laws of the Ohio State Dental Society have been sent the Secretary of each Component Society in number sufficient to supply each member with a copy. Ask your secretary for one.

F. R. Chapman, *Secretary.*

OFFICERS

President, C. W. MILLS, Chillicothe President-Elect, H. M. SEMANS, Columbus
Vice President, C. H. SCHOTT, Cincinnati
Secretary, F. R. CHAPMAN, 305 Schultz Bldg., Columbus
Treasurer, A. O. ROSS, Columbus

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305 Schultz Bldg., Columbus
L. P. Bethel, Editor W. G. Hamm

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Hamilton, Ohio
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The Component Societies of the Ohio State Dental Society

(This list of Officers is compiled from information furnished by the Secretaries of the various Components, where incorrect it is due to lack of information relative to elections. Secretaries are requested to keep the list correct by notifying the secretary of the State Society or the Editor of The Dental Summary of the result of elections.)

22 Butler County Dental Society, meets 3d Friday. each month.—Pres., P. A. Krucker, Hamilton, V. Pres., E. E. Meisterhaus; Sec.-Treas., F. T. Craven, Hamilton.

10 Central Ohio Dental Society, meets 1st Wed., Feb., May and Oct.—Pres., F. P. Leonard, Bucyrus; V. Prests., J. Pfanstiel and R. C. Bratten; Rec. Sec., L. T. McKinney; Cor. Sec., C. S. Delashmutt, Bucyrus; Treas., F. C. McCaughy.

27 Cincinnati Dental Society, meets 3d Friday. Pres., Wilson Foster, 22 W. 7th St.; V. Pres., Paul Cassidy; Rec. Sec., C. H. Stricker; Cor. Sec., D. A. Leahy, 904 Union Central Bldg.; Treas., J. D. Gordon

6 Cleveland Dental Society, meets 1st Monday, Pres., I. M. Saum; V. Pres., J. A. Loughry; Rec. Sec., S. F. M. Hirsch; Cor. Sec., F. M. Casto, 458 Rose Bldg.; Treas., E. D. Phillips.

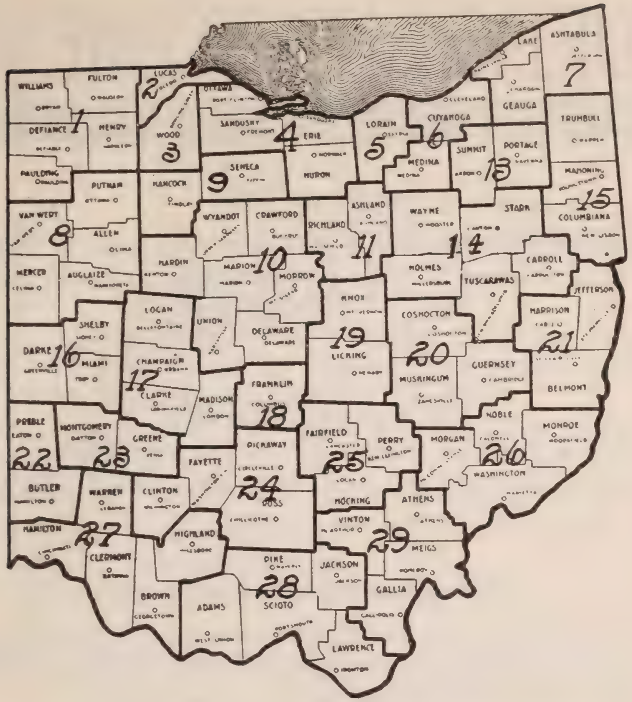
18 Columbus Dental Society, meets last Tuesday, Pres., D. P. Snyder; V. Pres., F. L. Gruber; Rec. Sec., E. N. Hoopman; Cor. Sec., F. C. Starr; Treas., A. O. Ross.

15 Corydon Palmer Dental Society, meets 2d Thursday, April and Oct.—Pres., J. F. Steele, Lisbon; V. Presidents, T. J. Evans, J. H. Chessrown and G. L. Moore; Rec. Sec., J. T. Williamson; Cor. Sec., W. B. Challis, Lisbon; Treas., J. K. Nash.

21 Eastern Ohio Dental Society, meets 1st Thursday, May and October—Pres., C. S. Starkweather, Bellaire; First V. Pres, L. B. Peterson, Steubenville; Second V. Pres., George Sharp, Flushing; Cor. Sec., J. K. Hunter, Bridgeport; Rec. Sec., H. A. Smith, Steubenville; Treas., S. C. Hasbronck, Barnesville.

9 Hancock - Seneca Counties Dental Society, meets 2d Wednesday.—Pres., A. C. Cole, Fostoria, V. Pres., ———; Rec. Sec., E. V. Burns, Findlay; Cor. Sec., A. E. Mann, Findlay; Treas., V. H, Michener.

25 Hocking Valley Dental Society, meets 1st Monday.—Pres., J. J. Stukey; Vice Pres'ts., C.F.Acker; and W. M. Scott; Sec., R. H. Wetzel, Lancaster, Treas., J. A. Rockey.



5 Lorain County Dental Society, meets 1st Tuesday, Feb., Apr., Sep. and Nov. Pres., F. A. Newhall, Lorain; V. Pres., C. J. Love; Sec., J. G. Wherry, Elyria; Treas., J. E. Trombley.

17 Mad River Valley Dental Society, meets 2d Monday, bi-monthly.—Pres., E. Dibert, Springfield; Vice Presidents., A. E. Bible and H. Houser; Rec. Sec., H. H. Krapp; Cor. Sec. W. B. Seward; Treas., E. V. M. Thompson.

1 Maumee Valley Dental Society, meets 2d Tuesday, June and Oct.—Pres., N. A. Cunningham, Defiance; V. Pres., A. S. Blake; Rec. Sec., S. D. Potter; Cor. Sec., O. J. Wisman, Delta; Treas., J. A. Benner.

23 Miami Valley Dental Society, meets last Monday. Pres., H. C. Huffman; V. Pres., H. L. Oliver; Cor. Sec., H. M. Brewer; Rec. Sec., W. B. MacBain; Treas., J. R. Arthur; J. M. Chase; representative to the State Dental Society.

20 Muskingum - Coshocton - Guernsey Counties Dental Society, meets 2d Thursday, Jan., May and Sept.—Pres., P. F. Walker, Coshocton; V. Prests., A. W. Boyd and T. E. Axline; Sec., J. A. Honabarger, Warsaw; Treas., H. J. Boyd.

4 North Central Ohio Dental Society, meets 3d Wednesday, Jan. Apr., July and Oct.—Pres., A. G. Thatcher, Fremont; Pres. Elect., E. S. Braithwaite, Willard; Vice-Pres., H. S. Rogers, Sandusky; Rec. Sec., D. D, Smith; Cor. Sec. J. H. Billmeyer, Norwalk; Treas., L. F. Meyer.

7 Northeastern Ohio Dental Society, meets 2d Monday —Pres., H. O. Frederick, Ashtabula; V. Pres., O. T. Battles; Sec., R. J. Goggin, Ashtabula Harbor; Treas., R. J. Goggin.

8 Northwestern Dental Society, meets 4th Wednesday.—Pres., A. Jones, Lima; Vice Pres'ts., J. R Cannon and I. W. Wright; Sec. J. W. Dimond Lima; Treas., J. K. Bannister.

29 Ohio Valley Dental Society, meets 2d Wednesday, Apr and Oct —Pres. M. D. Hartinger, Pomeroy; V. Pres., R. B. Church; Sec., C. S. Shumaker, Pomeroy; Treas., J. B. Hodge, Middleport.

24 Rehwinkel Dental Society, meets 3d Thursday. Pres., A. M, Bush; V. Pres., O. A. Thompson; V. Pres., C. H. Martin; Sec,, F. D. Wollard, Washington, C.H.; Treas., C. V. Laam.

11 Richland-Ashland Counties Dental Society, Meets last Monday. Feb., June and Oct.—Pres., B. W. Livingston, Ashland; V. Pres., J. H. West- Rec. Sec., I. R. Suter; Cor. Sec., J. F. Clark, Mansfield; Treas., E. F. Cleland.

26 Southeastern Ohio Dental Society, no report

28 Southern Ohio Dental Society, meets, 3d Monday. May and Oct.—Pres.,W. H. Johnson, Waverly. V. Pres., A. S. Adams; Sec., C. E. Beatty, Portsmouth; Treas., E. O. Buchanan.

12 Stark County Dental Society, meets 3d Wednesday—Pres., C. O. Carr, Massillon; V. Pres'ts., B. H. Bowman and J. G. Foltz; Rec. Sec., C. A. Allensworth; Cor. Sec., F. M. Lose, Massillon; Treas., F. M. Lose.

13 Summit County Dental Society, meets 1st Friday. Pres., J. T. Connors, Akron; V. Pres.,———; Rec. Sec., H. G. Haas; Cor. Sec., F. S. Butler, 2d Nat. Bank Bldg., Akron; Treas., A. S. Butler.

2 Toledo Dental Society, meets 3d Friday. Pres., T. S. Shaw; V. Pres., H. W. Hisey; Sec., L. C. Jackson, 2205 Ashland Ave.. Treas., C. H. Cox.

30 Tuscarawas County Dental Society (a new society) meets 2d Tuesday. Pres. A. W. Davis, Dover; V. Pres., F. H. Waldron; Sec. and Treas., E. S. Wagner, Dover.

16 Western Ohio Dental Society, meets 1st Thursday, Feb., May and Oct.—Pres., A. A. Davis, Troy V. Prests,, P. G. Eddy, J. J. Little and V. E. Bedford; Sec'y-Treas., F. A. McCullough, Troy.

3 Wood County Dental Society, meets 2d Wednesday.—Pres., B. D. Roe. Bowling Green; V. Pres., R. E. Milbourn; Sec., T. M. Lea, Bowling Green; Treas., E. R. Beatty.

19 W. D. Miller Dental Society, meets 2d Thursday. May and Oct.—Pres.,W. S. Deely. Mt.Vernon; V. Pres,, H. S. Barrick; Rec. Sec., L. E. Davis; Cor. Sec., E.V. Prior, Newark; Treas., W. B. Grossman.

SOCIETY·ANNOUNCEMENTS

Northern Ohio

The Northern Ohio Dental Association will meet at Hotel Statler, Cleveland, June 7, 8 and 9. Also post-graduate course same week.

Yours truly,
GEO. B. SMITH, *Secretary.*

Psi Omega Fraternity

The Reunion and convention of the National Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, July 12, 13 and 14, 1920.

Michigan State Dental Board

The next meeting of the Michigan State Dental Board for examinations will be held at Dental College, Ann Arbor, Michigan, June 14-19. Any one interested, communicate with the secretary.

B. S. SUTHERLAND, *Secy.-Treas.*, Owosso, Mich.

Indiana State Board

The next Indiana State Dental Examination will be held in Indianapolis, June 14th to 20th inclusive.

Applicants will be accepted from class A and B colleges.

Preliminary educational certificates must be examined by State Superintendent of Public Instruction two weeks in advance of the examination.

For further instructions and application blanks, address H. C. McKittrick, D.D.S., 1006 I.O.O.F. Bldg., Indianapolis, Ind.

Pennsylvania State Board

The next meeting of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh, on Wednesday, Thursday, Friday and Saturday, June 23, 24, 25 and 26. The theoretical examinations will be held at Musical Fund Hall, 808 Locust Street, Philadelphia, and at the College of Pharmacy, Bride and Bluff Streets, Pittsburgh. These examinations will begin on Wednesday, June 23rd, at 9:00 A. M., and will continue Thursday and Friday. The examination in practical work will be held on Saturday, June 26th, at 8:30 o'clock, and will be held at the Evan's Dental Institute, 40th and Spruce Streets, Philadelphia, and at the University of Pittsburgh, Pittsburgh. Application papers may be secured from the Department of Public Instruction, Harrisburg. For further information apply to Dr. A. H. Reynolds, secretary, 4630 Chester Avenue, Philadelphia.

Yours very truly,
ALEXANDER H. REYNOLDS,
Secretary to the Board of Examiners.

Vermont State Board

The next meeting of the Vermont Board of Dental Examiners for the examination of candidates to practice in Vermont, will be held at the State House, Montpelier, June 28, 29, 30.

Candidates will present for registration and preliminaries at ten A. M., Monday the 28th.

To be eligible for examination a candidate must be (1), twenty-one years of age; (2), a graduate of a high school of the first class; (3), a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 21st.

For further information and application blank, address,

HARRY F. HAMILTON, *Sec'y*,
Newport, Vermont.

Wisconsin State Board

The next examination of the Wisconsin State Board of Dental Examiners will be held in Milwaukee beginning June 21, 1920.

All applications and credentials must be in the hands of the secretary at least ten days before the examination.

Full information and application blanks may be received by addressing,

WILLIAM KETTLER, *Secy.*,
801 3rd St., Milwaukee, Wis.

Wisconsin State

The fiftieth annual (Golden Jubilee) meeting of the Wisconsin State Dental Society will be held at Milwaukee, Wisconsin, July 13-14-15, 1920.

Very respectfully,
DR. W. F. FAUST, *Secy.*,
308 North avenue, Milwaukee, Wis.

Idaho State

The next meeting of the Idaho State Dental Association will be held in Pocatello, June 28th to July 3rd.

The services of Drs. F. Ewing Roach and Arthur E. Smith, of Chicago have been secured for the post-graduate classes.

M. J. GOODE, *Secretary*,
Filer, Idaho.

Colorado State Board

The Colorado State Board of Dental Examiners will meet for the purpose of examining candidates for license to practice in Colorado, at Denver, Colorado, at the State House, beginning June 1, 1920, 8 A.M.

For further particulars and application blanks address

DR. R. C. QUICK, *Secy.*,
310 Metropolitan Bldg., Denver, Colo.

South Carolina State

The annual meeting of the South Carolina State Dental association, will be held in Columbia, S. C., Jefferson Hotel, June15-16-17.

Respectfully,
Greenville, S. C. EMET C. DYE, *Secretary.*

South Carolina State Board of Dental Examiners

The next meeting of the South Carolina State Board of Dental Examiners will be held at the Jefferson Hotel, Columbia, S. C., beginning at 9:00 o'clock, Friday morning, June 11.

Further information and application blanks may be obtained by addressing Dr. R. L. Spencer, Secretary, Bennettsville, S. C.

Tennessee State Dental Association

The Fifty-third Annual Meeting of the Tennessee State Dental Association will be held in Chattanooga, May 27, 28, 29, 1920.

The special attraction this year will be Dr. George Winter, St. Louis, Mo., subject: Exodontia. Dr. E. R. Hard, St. Louis., Bridgework and Porcelain. Dr. Chalmers J. Lyons, Ann Arbor, Mich., Focal Infection.

All ethical dentists are cordially invited to attend the meeting.

O. J. O'NEAL, *Chairman, Pub. Com.*, Chattanooga.

Florida State Dental Society

The next annual meeting of this society will be held in Miami, Fla., June 15, 16 and 17, at Hotel Plaza.

H. B. PATTISHALL, *Secy.-Treas.*, Jacksonville.

Railroads will yet come to a single ownership of standardized cars, with each road renting what it needs.

There seems room for a "Jeffersonian Democrat" with something more than a black felt hat and a goatee.

Does it require experiment to prove that there can't be two navies "second to none"?

American Dental Library and Museum Association

The next annual meeting of the American Dental Library and Museum association will be held August 23, 1920, 3:30 P.M., at the Forsyth Dental Infirmary, Boston, Mass.

The list of applicants for membership in the association have exceeded our expectations and we trust that all those interested in dental libraries and museums will forward their applications as soon as possible.

We expect to hold several sessions in Boston. At one of these will be discussions and papers that will be of interest to librarians, historians and curators.

The objects of the association are the creating and fostering of dental libraries and museums, and the maintenance of a system for exchange of dental literature, reprints, etc.; as well as gathering material for museums. Securing and distributing the transactions of all dental societies.

Membership: Any Dental Society, Association, University, College or Library, having a permanent home and a Dental Library. Any individual interested in dental literature or libraries.

Benefits: The banding together of a united body with a common cause. The betterment of conditions in dental libraries. A clearing house through which books, journals, reprints, *or lists of these,* may be sent from one library to another.

We desire to know what libraries now exist and how many would be interested in the association.

Application blanks will be forwarded upon request.

B. W. WEINBERGER, *Secy.-Treas.,*
40 East 41st street, New York City.

The National Anesthesia Research Society

At a meeting of the Board of Governors of the National Anesthesia Research society, held in Cleveland in March, it was voted to have the annual convention of the society at Pittsburg the week of October 4th, this meeting to be in conjunction with that of the Interstate Anesthetists association, and the Pennsylvania Medical society. It is possible that the Western Pennsylvania Dental association also will join in the meeting.

In order to augment interest in the primary purpose of the Society, which is research, the Governors voted two hundred dollars to be apportioned in prizes for the best papers on research in anesthesia, such papers to be read at the national meeting. This offer is open to all students, surgical, medical, and dental practitioners in the United States.

Canvass of hospitals having revealed need for a uniform anesthesia chart, a committee of three was appointed to prepare forms. The committee consists of Dr. A. F. Erdman, of Brooklyn, Dr. A. H. Miller, of Providence, and Dr. E. I. McKesson, of Toledo. It was also decided to prepare and publish at the earliest moment possible a monograph on the best practices in anesthesia in obstetrics.

Announcement was made of the acceptance of the following well-known physicians, dentists, and anesthetists as members of the Research committee: F. C. Mann, Rochester, N. Y.; John Evans, Buffalo, N. Y.; A. E. Guedell, Indianapolis, Ind.; Wm. Harper DeFord, Des Moines, Ia.; W. E. Burge, University of Illinois; Wm. Hamilton Long, Louisville, Ky.; J. Griffith Davis, Baltimore, Md.; J. J. Buettner, Syracuse, N. Y.; Dr. Tyler, Philadelphia, Pa.; Isabella C. Herb, Chicago, Ill.; A. F. Erdman, Brooklyn, N. Y.; A. H. Miller, Providence, R. I.; W. B. Howell, Montreal, Canada; R. S. Hopkinson, Milwaukee, Wis.; Oel E. Lamphear, Kalamazoo, Mich.; W. I. Jones, Columbus, Ohio; Theo. Casto, Philadelphia, Pa.; S. P. Reimann, Philadelphia, Pa.; John Polak, Brooklyn, N. Y.

A Century's Expansion

An even hundred years have elapsed since one William Wurts, a Philadelphia merchant, drove his team of mules with the first ton of anthracite through Spring freshets and bog land to the banks of the Delaware, and floated the new fuel down the river to Philadelphia on a pine-log raft. But he experienced no little difficulty in that first anthracite year of 1820 in overcoming the popular objection that coal was "extremely slow of lighting." Pine-log rafts floated only three hundred and sixty-five tons of anthracite that year. But it fetched a price of twelve dollars a ton and could be delivered freight-on-raft Philadelphia at three dollars—a fact that was freely advertised to attract additional capital, for of course there was no profiteering in those days!

Spring freshets and bog land and slow imflammability no longer worry operators in Wyoming Valley. Silk shirts for miners are a bigger nuisance. But production in a hundred years has jumped to eighty-six million two hundred thousand tons, and could this year surpass the one hundred million ton mark, which was almost reached in 1917. Reading, Wilkes-Barre, Lehigh, Mauch Chunk—these names are spoken a thousand times hourly in the industrial world today, simply because there lay up in the hills of Pennsylvania a hard, black substance, one ton of which sly old William Wurts steered on a raft down the Delaware to Philadelphia, just one hundred years ago.

SUGGESTIONS

Conducted by F. R. Chapman, M.S., D.D.S., Columbus, Ohio

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

Potassium Sulphate in Definite Proportions

In the January Summary, Dr. D. D. Campbell gives a method of using potassium sulphate to hasten the setting of plaster; I find a far better method is to use a stock solution somposed of sulphate of potassium, 30 grammes; water q.s. ad. 1000 cc.

This solution is used full strength for mixing the impression plaster and in this manner uniform results always follow. A given quantity of solution and a corresponding amount of plaster will set in a fixed number of minutes.—*Dr. James T. Quintero, Lyons, France.*

Use Dental Lac and Spence Metal

In making the tooth models for jacket crowns, if Dental Lac is used for impression and Spence Metal used to pour the models, beautiful results will be obtained.—*Elmer S. Best, Dental Facts.*

A Good Silex Investment

A good smooth investment material for inlay work and the coating of any wax pattern may be made as follows:

Take three pounds of the best powdered silex you can obtain, one pound of Kerr's white model plaster and four ounces of Venetian Red, mix them thoroughly by sifting through a flour sifter. When the color has become uniform, the mix will be satisfactory—*F. W. F., Pacific Dental Gazette.*

Abuse of Radiography

Radiography, which has proven a great blessing to dentistry, is one of the *most abused* dental aids. First, TOO MUCH reliance is laid upon the reading of dental films by casual examination. The commercial dental laboratory is doing more harm from day to day by making many dentists lazy and careless, who instead of relying upon their own work and judgment, refer their doubtful cases to the one dollar-X-ray man, who sends back a report, "Osteoclasia," which means infection, in his mind, and the tooth is extracted, even if the shadow is the mental foramen!—*Wm. J. Lederer, Dental Outlook.*

The Need of Occlusal Rests

In all forms of removable bridge work or partial dentures, where clasps are used, however, some form of occlusal rest is necessary as a means of providing against subsequent settlement of the case. If this precaution is not observed, complete loss of occlusion and usefulness will soon follow.—*Hart J. Goslee, Dental Facts.*

Cutting Tooth Structure with Carborundum Stones

Use a paste of fine carborundum grit with glycerin on the stones which have been mounted upon safety mandrels to prevent the paste from entering the handpiece. This paste facilitates cutting, is less painful to the patient and prolongs the life of the carborundum stones. The glycerin is pleasant to the taste and can be easily washed from the tooth.—*R. L. Newling, Pacific Dental Gazette.*

A Soldering Investment Aid

Many of the small investments for blow-pipe work are inconvenient to handle. Upon the suggestion of a member of the senior class of the College of Dentistry, U. S. C., I will recommend the following technic: Twist up a small desired loop on a piece of baling wire and enclose this loop within the investment at the time of investing the work. The twisted portion of the wire can serve as a handle for the boiling as well as for the soldering operation. The wire should be so placed that it will not interfere in any manner.—*F. W. F., Pacific Dental Gazette.*

Sluggish Gold

Gold for casting must be kept clean. Thoroughly melting while applying a little clean powdered borax materially helps in doing this. When the gold becomes sluggish in its flow after diligently applying the blow-pipe flame to melt it, it should be discarded. Some change has occurred in it's quality, which has taken away the easily-flowing property it formerly possessed. Unless this property is restored it should not be employed for casting.—*Sam'l Herder, Dental Outlook.*

To Make Band That Will Not Become Unsoldered

Cut the band three times the gauge longer than dentimeter measure. Bevel the ends to be soldered, one from inside, the other reverse—bevelled ends to lap one and one-half times gauge of band. Solder with one-half or one quarter millimeter square of solder. Use muriatic acid or borax for flux and plenty of heat.

—*Joseph Homer, D.D.S., Boston, Mass.*

If the revolt in Germany involves any personal risk we can well believe the Hohenzollerns have no part in it.

Inexpensive and Well-Fitting Pivot Crown

A pivot crown for temporary use, for hospital cases, or for any purpose which demands ease of construction and low cost, can be produced by the method described below.

The writer, in experimenting to produce a crown to do temporary duty (during the time a bridge including the same tooth was constructed), hit upon the idea, and found it worked so successfully that he now constantly uses it. Perhaps there is nothing very novel in the construction, but it seems to be such a time-saver as to merit a short description.

Cut off the natural crown in the usual way, shaping the root with a marked bevel, both to the lingual and labial side. Enlarge the root-canal with suitable reamers, and select one of Ash's crown posts of a suitable length for the root. These posts, which are strong and nicely tapered, are made with a little diaphragm or shoulder, which divides the pin into an upper and a lower part. By choosing what is called an "offset" post, or by inserting the lower part of the post in an Ash's post-bending tool and bending back the upper part; the latter is bent inward, out of the way of the tooth pins. Choose an ordinary gold-clad pin tooth (solila or anatoform) which will suit the case, and grind it to fit the root. Soften a very small ball of pink modeling wax, and having pushed the upper part of the post into it up to the shoulder, press the chosen tooth into an approximately correct position relative to the post. Again soften the wax slightly. Place the post in the root, and at the same time force the tooth into an accurate position, and knead the ball of wax to cover the root and the back of the tooth. Take out, chill, trim up, and retry. In the workroom fit a sprue to the wax on the mesial or distal surface of the tooth, and at right angles to the post. Invest, and burn out the wax. Cast cold with acolite, and a strong, well-fitting pivot crown is the result.

With regard to the speed of making such a crown, the writer (who makes no claim to work quickly) recently cut off a central incisor, prepared the root, and fitted the crown in wax in half an hour; while another half-hour served to have it invested, cast, and polished. One should, in criticising this, remember that it is in no sense a ready-made or store crown, but fits as perfectly as it is possible to adapt any crown, however laborious the method.—*Norman Black, British Dental Journal.*

Cutting Up Solder

Solder should be used in as large pieces as can be put on the work. One or two pieces the right size for a crown will give better results than numerous small pieces. The reason for this is that oxid on a large piece is much less in proportion to bulk than the skin on a small piece, and the weight of the larger portion will break the skin easier. Again less borax is necessary, and the lesser the borax used the better, provided enough is used.—*Oral Health.*

Use of Clasps in Bridgework

There have been many arguments pro and con in the use of the clasp. The objection has been raised that they wear off the enamel by actual abrasion. I do not believe this to be the case. On the other hand, I have seen numerous instances where the clasp has been worn through by the friction of the teeth themselves with no appreciable wear to the enamel. I have found if there is any wear it is not the abrasive action of the clasps (for if you stop to think, we know that the clasp is of a softer material than the enamel itself), but is due to the collection of a film of partly disintegrated food which is left on the inside of the clasp and eventually dissolves the substance of the enamel which renders the tooth softer than the clasp, and then the enamel is rubbed away by the movement of the clasp. If the patient gives the clasp the necessary care, this objection can be entirely overcome, and I can say that in the approximately four years that I have been keeping a record of the cases where the enamel has disintegrated under the action of the clasps, I find that I have only two such cases. In both instances the patients' care of their plates was far from satisfactory. I think it is a good thing to have the clasp absolutely polished on the inside and the patient should be instructed to polish the clasps once a day with an orange-stick and bicarbonate of soda. It takes only a moment to do this work, and the clasps will wear well and give good results.—*Dr. Edward Kennedy, Cosmos.*

Contact Point in Gold Crown Restoration

It is important to restore the contact point when constructing proximal inlays. This aids in preventing the food from being jammed between the teeth and injuring the gums. Orthodontists have shown the vast amount of disturbance in the normal occlusion of the teeth, which has been accomplished by the failure of dentists to restore contact points, gingival margins, cusps and other important anatomical parts of the teeth, when constructing inlays or other types of fillings.—*S. Herder, Dental Outlook.*

Sluggish Gold

Gold for casting must be kept clean. Thoroughly melting while applying a little clean powdered borax materially helps in doing this. When the gold becomes sluggish in its flow after diligently applying the blow-pipe flame to melt it, it should be discarded. Some change has occurred in its quality, which has taken away the easily-flowing property it formerly possessed. Unless this property is restored it should not be employed for casting.—*S. Herder, Dental Outlook.*

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

My space must be limited this month. Dr. Bethel demands more and more room each month, and there is but one place to get it—right here. Last month we printed an extra sixteen pages; this month an extra thirty-two; all crowded with the finest and most helpful material that has been printed in any dental magazine "since Hector was a pup." Articles such as those now appearing in The Summary, from the minds of such men as Dayton Dunbar Campbell, W. H. O. McGehee, J. P. Henahan, and all the others, solid, practical, helpful instruction, based upon actual experience, are of much more importance than anything that I might write; and it is with pleasure that I yield precedence to them, and invite every reader of The Summary to make himself master of the contents of the literary department of this and succeeding numbers.

The first post-graduate course for dentists ever held in the city of Buffalo opened at the Iroquois hotel on the morning of April 12, with an enrollment of one hundred and thirty-five. The total cost of the course is reported by the lay press to be six thousand dollars, of which four thousand dollars was paid to intructors, including such men as Dr. L. M. Waugh, of Columbia, and Major W. E. Cummer, of the Royal college, Toronto. Dr. Robert E. Hall, Chicago, presided over the department of artificial dentures.

Two Summary readers volunteered for service in Serbia under the Red Cross during the past two months—making a total of around thirty M.D.'s and dentists who have accepted the call, including Dr. Kenneth W. Murphy, of the faculty of the Chicago dental college.

The lay press, particularly *The Saturday Evening Post*, is devoting an increasing amount of space to dentistry and oral hygiene, all of which is very gratifying to those of us who, eight or ten years ago, had to fight for the merest recognition, offers of articles often being met by reference to the advertising department and the invitation to "come in, at regular space rates." One could wish, however, that such publications as *The Post* might be just a little more accurate as to their statements of supposed fact. In an article appearing in that enterprising weekly for the week of April 10, the statement appears, at least by inference, that artificial teeth are made from the bones of the steer! Why discriminate against the hog? Seen in action at hotel and restaurant tables, some of the wearers of artificial teeth ought to be far more comfortable with an outfit of porker-bone origin than one from the cleanly and discriminating beef.

The demand for trained dental assistants is increasing much more rapidly than the supply. Why not suggest the desirability of taking up this work to sensible young women of your acquaintance? No avenue of employment opens more invitingly, either as to hours, pleasant work or remuneration.

The annual spring clinic of the Memphis Dental society, was held April 13-14, and was addressed by such notables as Drs. Norman B. Nesbett, Boston; E. B. Owen, St. Louis; R. J. Monette, Birmingham; H. B. Johnson, Atlanta; Earl J. Logue, Pine Bluff, and many local specialists. The meeting was the largest and most successful ever held at Memphis.

It is my opinion that dentifrices should be dispensed by dentists and not by drug stores; and that dentists should prescribe that particular paste, powder or wash that seems best suited to the conditions found in the mouth of each patient. It also is my opinion that dentists should many times forbid the use of the toothbrush, always where open caries are present in the mouth, and instruct the patient to use a soft cloth or felt instead, and to avoid contact with sound teeth with that part of the substance used to clean the carious teeth. Anybody agree? Is so, why not start something?

Dr. Walter B. Reinhard begs to announce that he has opened an office, for the general practice of Dentistry, at 408 Clinton avenue, Newark, N. J.

The mother of Dr. P. A. Gould, of Gibsonburg, Ohio, died April 12, 1920.

U. S. Public Health Service

DENTAL EXAMINERS APPOINTED BY THE BUREAU OF WAR RISK INSURANCE SINCE LAST REPORT

Cheboygan county, Mich., Dr. A. E. Sangster, Cheboygan; Rome, N. Y., Dr. Harold E. Dorn; Red Lake county, Minn., Dr. A. E. Lucian, Red Lake Falls; Yonkers, N. Y., Dr. Victor A. Martin; Alta Vista, Ia., Dr. L. A. Kieren; Greene county, Ohio, Dr. E. J. Reynolds, Xenia; Mercer county, Ill., Dr. W. W. Moorehead, Aledo; Hibbing district, Minn., Dr. Wilbur Wring, Hibbing; Delaware county, N. Y., Dr. Leroy D. Neish, Walton.

Fluxes

ARE the fluxes you are using satisfactory in all respects? You know that soldering and casting are delicate operations and that the flux you employ helps to determine your degree of success.

THE NEY FLUXES

(*Weinstein Formulae*)

were not developed by guess-work. They are the product of exact science and each meets the definite requirements of the class of work for which it was prepared.

Ney's Soldering Flux
Ney's Reducing Flux
Ney's Oxidizing Flux

Procure them from your dealer and test their merits; or write to the manufacturer for description of properties.

IF YOUR DEALER CANNOT SUPPLY ANY ARTICLE OF OUR MANUFACTURE, WRITE TO US

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PLATINUM ETC.

Dentists Charter Train

E. S. Braithwaite, secretary of the Ohio Dental Convention Club, has sent out notices announcing the completion of arrangements for a special train from Cincinnati via Hamilton, Dayton, Columbus, Galion and Cleveland to Boston for the dental convention, which will be held in that city during the week of September 13th.

Ohio—Miami Valley

Dayton, Ohio, April 1.—At its recent meeting the Miami Valley Dental society elected F. W. Cockerill president, to serve next year. H. L. Oliver has been elected president for the ensuing term, beginning in September.

W. B. MacBain has been chosen recording secretary; H. M. Brewer, corresponding secretary, and J. R. Arthur, treasurer.

Indiana—Whitley County 100%

Columbia City, Ind., April 3.—All of the dentists in the county met Thursday evening at the office of Dr. B. F. Slessman, in this city, for the purpose of organizing so that they will get in closer touch with each other and become more familiar with new developments which come about in dentistry. The election of officers resulted in B. F. Slessman being chosen president; F. B. Weaver, of Churubusco, vice-president, and J. F. Brenneman, of this city, secretary-treasurer. It is the plan of the society to meet once each month, rotating between this city, South Whitley and Churubusco.

Indiana—Wabash Valley

Peru, Ind., March 26.—An all-day meeting of the Wabash Valley Dental association was held here today. The outstanding features of the meeting were clinics conducted by Mendel Nevin, of Brooklyn, N. Y., on "Conductive Anesthesia," and by Dr. Cofield, of Indianapolis on "Extraction."

Indiana—Western

Terre Haute, Ind., March 12.—More than one hundred dentists registered at the convention of the Western Indiana Dental society. After the business session, the program was devoted to clinics and exhibitions, a banquet and theater party. George Marbach, of Terre Haute was elected president; A. A. Spears, of Brazil, vice-president; Noble Fox of Terre Haute, secretary; L. E. Trinkle, of Terre Haute, treasurer; W. G. Rice, of Terre Haute, state trustee. Society trustees elected were: O. M. Brown, three years; George Russell, two years, and F. P. Anshutz, one year. All are Terre Haute dentists.

New York—Sixth District

Binghamton, N. Y., March 27.—Members of the Sixth District Dental society, at the meeting held last night, went officially on record as being opposed to the Compulsory Health Insurance bill as it now stands.

The officers elected are: President, H. B. Mitchell of Elmira; vice-president, Henry V. Heiss of Johnson City; secretary, Edward R. Gillespie of this city; treasurer, E. L. Pitcher of Cooperstown. F. W. Willis of Ithaca was re-elected censor to serve with W. J. LeSeur of Oneonta and Charles W. Cox of Horseheads, whose terms have not expired.

Guy H. Brady of this city was chosen representative on the state society legislative committee, and H. D. Whitmarsh of this city, and F. W. Champlin of Oneida, the retiring president, were selected as members of the oral hygiene committee.

New York—Seventh District

Rochester, N. Y., April 10.—The fifty-second annual meeting of the Seventh District Dental society of the state of New York came to a close this evening with a dinner at Hotel Seneca. At the opening meeting at the Dental Dispensary yesterday, the following papers were read after the address by the president: "Root and Canal Work During the Eighties," by F. A. Green; "Clinical Evidence," by J. H. Parmelee; "Pyorrhea of the Ancients," by H. Holmes; "Value of Temporo Mandibular Articulation," by H. O. Brown. Various clinics will occupy the attention of the members this afternoon.

The officers elected yesterday afternoon were: President, E. L. Schlottman; vice-president, J. L. E. Banks; recording secretary, F. J. Shaddock; corresponding secretary, S. J. Meaker of Auburn; treasurer, W. B. O'Neill, and librarian, J. Edward Line.

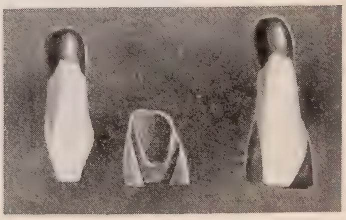

Illustration shows a frail and badly-decayed central incisor tooth, restored with pure gold inlays and supported by the attachment.

Saves Crowning and Killing Nerves

Dr. J. P. Carmichael, of Milwaukee, is now conducting regular classes on The Carmichael Inlay Attachment, each month in his own office. A series of clinics are given over a period of three days.

Those who are too busy to attend the three-day clinic can be taught this work by means of a complete demonstrating outfit, sent by mail, consisting of models and illustrations, the technic being carried out step by step. If a dentist has a case on hand where he would like to use the attachment, by sending a plaster cast the work will be defined on the model showing the preparation and how to make the wax form.

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Two Illustrated Lectures, by Dr. Norman B. Nesbett, of Boston, Mass.
Harvard University, Dental Dept.
ON REMOVABLE BRIDGE WORK

Dr. Thomas B. Hartzell, of Minneapolis, will give two Illustrated Lectures, one on "Pyorrhea and its Treatment," and one on "The relation of Dental Diseases to the Public Health."

Doctor John Paul Jones, of the Mayo Clinic, will give an Illustrated Lecture on "The Position of Dentistry in Group Medicine." Covering the question of Focal Infections and their relation to disease, the importance of the X-Ray in determining this, the necessity for full-mouth Radiograms and when to take a radical stand for the extraction of teeth, etc., with slides showing many practical cases presented for treatment at the Mayo clinic.

Indiana will be represented by the following:

Drs. Wm. C. Hessler, of Crawfordsville, Robt. Gillis, of Hammond, and Carl D. Lucas, of Indianapolis.

There will be an all-day clinic by Dr. Norman B. Nesbett besides an unusually large number of other Clinics.

The Exhibits will be in the famous Riley room at the Claypool Hotel, and as all the floor space has been taken there will be a large number of Exhibitors.

Altogether this will be one of the very best meetings the Indiana State Dental Association has ever held.

Make Your Hotel Reservations Early!

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Disliked Dentist's Price, Made His Own Teeth

Tyrus Dunn, living near Atlanta, Ga., needed several new teeth. He consulted a dentist. Dunn was shocked at the estimated cost of the repair work which the dentist said was necessary.

"Won't stand for it," he said; "I'll make them teeth myself."

Dunn, who is a watchmaker, molded his teeth in his shop in molds made from beeswax. He fitted them himself and now he demonstrates to friends by biting chews from his tobacco plug and cracking nuts with his teeth.

The R & R *All Glass* Syringe Sterilizer

2½ inches from top of Jar to top of Glass Rack.

4¾ inches from top of Glass Rack to bottom of Jar.

Provides Space for Two Syringes with Needles and Two Novocain Cups or Four Syringes

THE cover is ground to a perfect contact fit of the jar, having inside ledge and top shoulder, preventing evaporation and allowing easy removal; no trouble from sticking because of the glycerin.

The Glass Rack rests upon glass standards, cast in the jar, avoiding the use of metal.

The jar is filled to the required depth with a solution made of 50% alcohol, 15% glycerin and 35% R & R Sterilizing Solution (Sodium Phenique Compound). The syringes with chucks and needles attached are suspended in the solution deep enough to immerse the chuck.

The Glass Rack and contents may be lifted out as shown.

The care of a syringe will result uniformly in keeping the instrument in perfect working order.

Ask your Salesman about it

Price, complete, without Syringes and Cups	**$5.00**
Syringe Support for holding small Syringe	**.35**

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made of nichrome ribbon and especially designed for durability, service and quick action. This is operated by

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Portland, Ore., U.S.A.

Wisconsin—State

Green Bay, Wis., March 10.—With a banquet following a most interesting and instructive meeting, the Fox River Dental association completed its regular meeting today,

The annual election of officers resulted: R. G. Chady, of Oshkosh, was elected president; G. J. Mortell, of Green Bay, vice-president; T. J. Seiler, of Neenah, secretary and treasurer. The executive board is composed of the following dentists: One year, L. H. Moore, of Appleton, and R. G. Chady, of Oshkosh; two years, G. A. Stratton, of Fond du Lac, and W. E. Tennant, of Oshkosh; three years, F. R. Houston, of Green Bay, and J. M. Donavan, of Neenah. Twelve additional members from points throughout northeastern Wisconsin were added to the association.

Kentucky—State

Louisville, Ky., April 10.—Clinics of brief duration made up the programme today for the Kentucky State Dental association convention in The Seelbach auditorium, with final adjournment also scheduled for today. Officers of the association were elected at a meeting yesterday as follows: President, W. W. Taylor, Lexington, to succeed G. G. Bell, Ashland; vice-president, E. D. Hardin, Madisonville, and treasurer, R. P. Keene, Owensboro. W. M. Randall, Louisville, secretary, was re-elected.

More than three hundred dentists have been attending the sessions. A number of clinics were held yesterday and much business also

Post-Operative Pain Control

ACTIVATED TABLETS
SEDAVOL
CASE

as introduced in *Dental Cosmos* in 1919, and recommended by dentists and physicians.

Order from your Supply House and have your druggist order the druggist size for your prescriptions.

THE DENTAL PHARMACEUTICAL CO.
Holton, Kansas

THE tablets are indicated wherever pain is anticipated or in progress. In cases of odontalgia, neuralgia, headache, pyorrhea, soreness and pain, excruciating pains from dead, putrescent pulps, pericementitis, abscess teeth, but was especially prepared to control post pain from the post-operative viewpoint. In antrum troubles, after all surgical procedures, extractions, apiocectomy, curettements, process excision, removal of impactions, especially third molars where the post pain is so severe and lasts for indefinite periods, these Sedavol tablets will absolutely control the pain.

PATIENTS are impressed by this form of treatment when informed it is harmless, not a narcotic, and its use explained, they realize you are doing your utmost for their comfort, in a most scientific, professional way. The prescription puts the proper finis to the operative procedure and the tablets put a tight stopper on post pain. An ideal, ethical harmless means to control the most aggravating griefs in the dentists' curriculum.

THE proper way to administer is to get early control and maintain it, by giving two tablets before an operation; where an anesthetic is used (block) you get full control before the anesthetic wears off. By giving ½ to 1 hour before, it is even better, and then 2 immediately after operation and a prescription to druggist for more for use every 1, 2 or 3 hours at home.

was transacted. Milton Board, United States Public Health Service, Louisville, addressed the association last night on the public health subject. An illustrated talk on bridge work by Norman Beverly Nesbett, Boston, also was a feature yesterday. A banquet was held last night by the National Association of Dental Men, composed of exhibitors.

Papers and discussions will be published in THE DENTAL SUMMARY, official magazine of the Society.

Illinois—State

Chicago, Ill., March 25.—J. P. Luthringer, of Peoria, was elected president of the Illinois State Dental society, for the year 1920, today and Frederick B. Noyes, 122 S. Michigan ave., was elected president-elect, for the year 1921. C. W. Coltrin, 59 E. Madison street, was elected vice-president. The secretary and treasurer will be elected later.

Members of the executive council elected are: R. M. Pearce, Rock Island; A. B. Patterson, Joliet; P. A. Piper, Pontiac; W. B. Young, Jacksonville; J. E. Elslager, Decatur and W. A. McKee, Benton.

The Chicago members of the executive council are:

W. T. Reeves, 159 N. State street.; E. D. Collidge, 25 E. Washington street; Victor H. Fuqua, 25 E. Washington street; C. M. Cahill, 1553 W. Madison street and F. B. D. Idler, 30 N. Michigan ave. Attendance, six thousand.

South Dakota—State

Sioux Falls, S. D., April 3.—With a unanimous opinion that the thirty-third annual meeting was the most beneficial in the history of the organization, the South Dakota Dental association sessions at the coliseum came to a close this afternoon after a solid week devoted almost entirely to post-graduate work.

At the business meeting last evening the following officers were elected: Archie Stutenroth, of Watertown, president; E. W. Elmen, of Sioux Falls, re-elected secretary; Ferd Brown, of Sioux Falls, re-elected treasurer; R. G. Lanning, of Sioux Falls, was re-elected to manage the post-graduate course next year which will again be held in Sioux Falls.

Questionnaires given out among the attending dentists to get their concensus of opinion regarding the first post-graduate course meeting, showed that everyone present approved of the plan and were anxious to have it adopted for next year.

Texas—State

Dallas, Tex., March 13.—Dentists from Oklahoma, Colorado, New Mexico, Arkansas, Missouri, Louisiana and Texas, seven States, are in attendance at the fortieth annual convention of the Texas State Dental society, which will conclude its six-day session in Dallas today. Dallas was selected as the place for the next convention, and officers of the society were elected and installed last night as follows: G. Waller Staples, Dallas, president; W. D. McCarty, San Antonio, first vice-president; Joseph P. Arnold, Houston, second vice-president; J. G. Fife, Dallas, secretary-treasurer; E. W. Smith, Dallas, member of the executive committee for 1921, 1922 and 1923.

The office of curator of the museum was abolished, and the museum exhibit was loaned to the Baylor University College of Dentistry. Eighty-three applications for membership in the society were received at last night's session. The post-graduate class plan was adopted for 1921.

Between three hundred and fifty and four hundred dentists and their wives were entertained in the junior ballroom of the Adolphus Hotel following the general session, with a buffet luncheon and dance and offerings by vaudeville performers from local theaters.

Dental Hygienists Organize

We would appreciate notation in your magazine of the organization of "The Dental Hygienists of California," an association of graduate Dental Hygienists, just formed.

The object of this new society is for the furtherance of the Oral Hygiene Campaign, and to broaden the education of the hygienist.

The officers are: President, Mrs. A. O. Wright, of Oakland, graduated from University of California as Dental Hygienist; vice-president, Miss Elma Platt, of San Francisco, Forsythe graduate; treasurer, Miss Helen Prosser, San Francisco, Dental Hygiene graduate of California; secretary, Miss Charlotte Greenhood, San Francisco, Forsyth graduate.

At the monthly meeting of the Summit County Dental society, held in Akron, Ohio, on Friday, April 2, C. D. Peck of Sandusky, Ohio, gave a paper and clinic on "Jacket Crowns for Porcelain and Gold Work." Dr. Peck handled his subject very well and his talk proved to be of great interest to the society.

SAL HEPATICA
MATERIALLY AIDS
Local Treatment in
PYORRHEA
Bristol-Myers Co.
New York

Camp Dix Has Heavy Loss

DENTAL INFIRMARY, WITH EQUIPMENT WORTH TWENTY-FIVE THOUSAND DOLLARS BURNS

Fire of mysterious origin, starting when the building was deserted at the dinner hour Friday, April 2, destroyed Dental Infirmary No. 1, near Camp headquarters, causing the most serious loss from a money standpoint, in the history of the camp, as the building contained equipment valued at twenty-five thousand dollars.

An immediate investigation of the fire has been ordered by Major General Hale. The

A Record of Nearly Twenty Years' Success in the Treatment of

Putrescent Pulps *and* Root Abscesses

More Than Ten Millions of Treatments Per Year

Ninety per cent. of cases, whether of long standing or acute, yield promptly to the bland and healing influence of Oxpara in the hands of the average dentist.

Registered in U.S. Patent Office
Prepared by E. W. Dodez, D.D.S., Fort Wayne, Ind.

Simple and Definite Technic — No Complicated Guess Work

Oxpara has brought the treatment of all forms of abscessed and putrescent pulps easily within the skill of every dentist, placing in his hands a safe, sane and sensible method of restoring diseased teeth to usefulness and preserving them in that condition for many years.

Oxpara is today, as for many years, the dependence of many thousands of able dentists, not only in America, where it is best known, but in every country in the world where modern dentistry is practiced.

For the Isolated Dentist

In districts remote from the activities of the research man and the specialist, Oxpara is truly a God-send, enabling the isolated dentist to preserve and restore millions of teeth that otherwise would necessarily be condemned to the forceps.

Since the introduction of Oxpara nearly twenty years ago, many so-called treatments have been devised, exploited, tested to the finish, and discarded, while Oxpara has gone steadily forward, constantly gaining in the confidence of the general practitioner.

Ask for Instructive Pamphlet

Price Unchanged Since its Introduction

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CLEVELAND GRAND RAPIDS FLINT COLUMBUS
DETROIT AKRON

general opinion is that a discarded cigarette butt started the blaze, but an equally mysterious fire that recently destroyed two wings at the base hospital has caused some speculation as to the presence of an incendiary in the camp.

MEETINGS STATE BOARDS OF DENTAL EXAMINERS

Vermont—June 28-30, Montpelier; Harry F. Hamilton, Secy., Newport.

Wisconsin—June 21, Milwaukee; William Kettler, Secy., Milwaukee.

Indiana—June 14-20, Indianapolis; H. C. McKettrick, Indianapolis.

Minnesota—June 18, Minneapolis; C. G. Gillan, secy., Austin.

California—June 21, San Francisco; C. A. Herrick, secy., San Francisco.

Nebraska—June 8-12, Lincoln; H. H. Antles, secy., Lincoln.

Iowa—June 7, Iowa City, C. B. Miller, secy., Des Moines.

Pennsylvania — June 23-26, Philadelphia-Pittsburgh; A. H. Reynolds, secy., Philadelphia.

South Dakota—June 23-26, Sioux Falls; L. S. Spencer, secy., Watertown.

Texas—June 7-11, Dallas, Harrison B. Core, secy.

Mississippi—June 15, Jackson; B. J. Marshall, secy., Marks.

North Carolina—June 19, Wilmington; F. L. Hunt, secy., Asheville.

Maine—July 7-9, Augusta; Henry Gilman, secy , Portland.

DEATHS

At Boston, Mass., March 16, Dr. Frederick F. Gage, aged 76.

At Summerfield, Ohio., March 19, Dr. J. R. McGinnis, aged 71.

At Lewistown, Pa., March 17, Dr. W. S. Shaeffer, aged 70.

At Tulsa, Okla., March 20, during the meeting of the State Dental society, Dr. Frederick H. Coulter, of Oklahoma City, president-elect of the society, dropped dead of apoplexy while taking his seat in an executive meeting.

At Albuquerque, N. M., March 11, Dr. F. A. Sutherland, of Denver, Colo., aged 70. For thirty years he had been head of the State board, and served as a member of the State legislature for one term.

At Doylestown, Pa., March 23, Dr. Hutchinson P. Yerkes, aged 79.

At Grand Rapids, Mich., March 26, Dr. Harry H. Dewar, aged 51. He had practiced at Grand Rapids twenty years.

At Brooklyn, N. Y., April 1, Dr. Cornelius Wise, retired.

At Fort Wayne, Ind., April 9, Dr. J. David Coyle, retired, aged 84.

At Chicago, Ill., April 9, Dr. Rawson K. Pinkerton, aged 61.

At Chicago, April 12, Dr. A. E. Austin, of heart failure, in the shower room of the Y. M. C. A., aged 38.

No Bargains in Citizenship

During the war a native of Sweden living in Providence, R. I., claimed exemption from military service on the ground that he had not become naturalized. He had received his first papers, but when called in the draft he claimed immunity on the ground that he was still a citizen of a friendly neutral nation.

This claim was found sufficient and he was not forced to shoulder a gun. The other day he appeared in federal court to complete his naturalization, but when he asked to be permitted to take the oath of allegiance the judge with commendable spirit barred him forever from citizenship.

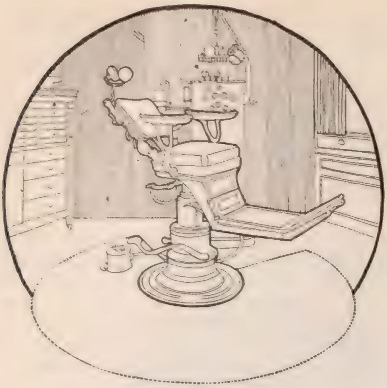
This man, who believed that American citizenship was of so little value that it could be obtained without cost, knows by this time that the privilege is one that must be purchased by loyalty and service. It is well that he was given the lesson and it will be well if others of his ilk take heed, for citizenship in the possession of men like him is apt to be abused and exploited. The right to be a citizen carries with it obligations and responsibilities—it is not in the "something for nothing" class. Neither is it on the bargain counter. Those not willing to pay the price most certainly are not eligible to receive its benefits.

—Editorial, Toledo Blade.

Shirts on the Installment Plan

The output of silk factories in the United States for the past year about trebled their output in 1914. Imports of silk manufactures from other countries aggregate about fifty million dollars. Exports of silk products about twenty-five million. During the past year the prople of the United States have been paying a billion dollar silk bill. Never have prices for raw silk from abroad been so high, yet more raw silk has been imported than ever before. In Chicago they're even selling silk shirts on the installment plan. Wage earners and small traders seem to be buying widely. Why is it that a silk shirt seems a badge of luxury and aristocracy and the possession of one so sought for, even in the face of extravagance? Meanwhile the Bombyx Mori, or common silk worm, keeps right on spinning industriously. He never did seem to care much about prices!

The area of harvested crops for 1919 amounted to a total of 359,124,743 acres, more than 2,645,311 acres larger than last year. The value of farm crops harvested last year totaled $14,092,740,000, exceeding the value of 1918 crops by $1,492,214,000.



The Circomat is a great addition to a dental office. Its springy surface of deep, live rubber softens the hardest floor.

Nearly all good dental supply houses in the United States sell the Circomat. If your dealer does not, send us his name and we will arrange to supply you.

United States Rubber Company

1790 Broadway, New York City

	½ Circle	¾ Circle	Circle
Black	$15.00	$20.00	$25.00
Mahogany	20.50	29.00	37.00
White	21.00	30.00	39.00
Green	22.00	32.00	41.00
Gray	23.00	33.00	43 00

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Circomat

United States Rubber Company

Cleveland Society Banquets Ex-Service Men

In the lattice room of the hotel Stattler, on the evening of April 5, the Cleveland Dental society and the Cleveland Unit of the Preparedness League of American Dentists, sat down together at a banquet at which the ex-service members of the profession in and about Cleveland were guests of honor.

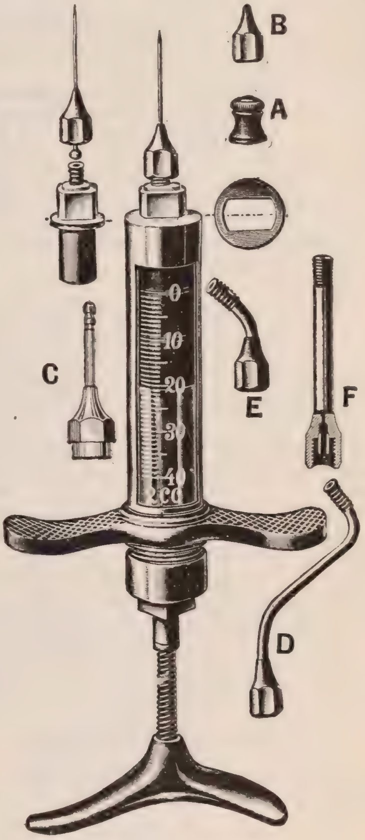
Following the dinner, E. H. Shannon, president of the Cleveland Unit, introduced as toastmaster, W. H. Whitslar, than whom he could have made no more able or worthy

The Genuine "FISCHER"
(All Glass and Metal)

R&R Hypodermic Syringe
No Leather or Rubber Washers

These Syringes are made of metal and glass only, with graduated glass barrels, accurately fitting nickeline plungers, extra large and strong movable finger bars, checkered on the gripping surface, and screw extension rod with crutch handle, which adjusts itself to the ball of the thumb and permits of the exercise of particularly strong pressure. Their entire surface is uniformly round, smooth and broad edged. Small grooves and edges, apt to retain dust and impurities, difficult to clean, are avoided. The mounts, chucks and connections (see illustrations) can be screwed firmly down with small spanner furnished with each; they are thus joined with positive security to the syringe nipple without the use of either leather or rubber washers. Such washers are not aseptic, a perfectly tight joint cannot be made with them and they quickly wear out. The nonuse of washers represents a great and convenient practical simplification and an important therapeutic improvement.

Connections shown in illustration, have a layer of soft composition metal and a central hard metal bushing embedded above their interior screw threads. The shanks are of very small bore, reducing waste of fluid to the minimum.



40 minim or 2 ccm Syringe
⅔ actual size

Prices in U. S. A. (40 Minims)

Syringe only, with cap and wrench	$ 6.50
Syringe Outfit, including 2 doz. Needles, Chucks and Connections,	10.00
Syringe Outfit, in metal case	12.00

The 1⅝ inch needle is used for mandibular anesthesia.
Directions for use accompany each Syringe.

NOTE—Professor Fischer recommends the exclusive use of the short bevel pointed needles, the outside diameter of which is about 25 gauge, regular Schimmel needles.

The Ransom & Randolph Company
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choice, who took charge and saw that everything moved off in a thoroughly delightful manner.

The principal speakers were: Colonel Robert T. Oliver, Dr. Haven Emerson and Major Leonard G. Mitchell. Following the addresses, and closing a most unusual evening, was presented a three-reel film, "Come Clean," illustrating the prevention of disease through proper care of the teeth.

The invitation, program and honor roll were prepared by J. V. Gentilly, of Cleveland, and were both unique and attractive.

It may be well to say that Dr. Emerson was Superintendent Sanitary Department, New York City, '14-'15; Commissioner of Health, '15-'17; Colonel, Medical Corps, '17-'19; now Professor Hygiene and Preventive Medicine, Cornell; Lecturer Teacher's College, Columbia; conducting the Hospital and Health Survey, City of Cleveland. Major Mitchell is a member of the Dental Corps, U. S. A.

Odontological Society—West

Pittsburg, April 14.—At yesterday morning's session the following officers were elected for the ensuing year: J. C. G. Fitz-Hugh of McKeesport, president; W. E. Mendle, vice-president; Leslie Waddell, of Pittsburgh, corresponding secretary; S. H. Wolfe, of Washington, recording secretary; H. C. Rink, treasurer; R. P. McGee, editor; A. C. Barclay, librarian; W. S. Cook, C. E. Whitehead and A. C. Young make up the board of censors; membership committee, J. C. Hipple, B. P. Rial and L. W. Ohl; auditing committee, W. W. Booth and P. V. McParland; program committee, J. C. G. Fitz-Hugh, W. E. Mendle, H. J. Horner, C. E. Whitehead and B. P. Rial; committee on dental literature, J. D. Whiteman, A. C. Barclay and T. A. Hogan.

Dental Society Meetings
1920

NATIONAL DENTAL ASSOCIATION

August 23-24-25-26-27—Boston.

STATE SOCIETIES

May—Massachusetts, Boston; 4-5-6, Iowa, Cedar Rapids; 11-12, North Dakota, Grand Forks; 13-14-15, New York, Albany; 17-18-19-20, Indiana, Indianapolis; 17-18-19-20-21-22, Nebraska, Lincoln; 27-29, Tennessee, Chattanooga.

June—Maryland, Baltimore; Maine; New Hampshire, Manchester; New Mexico, Albuquerque; Southern California, Los Angeles; South Carolina, Columbia; Utah, Provo; 9-10-11, Georgia, Atlanta; 14, Colorado, Colorado Springs; 14-15, Wyoming, Cheyenne; 15-17, Florida, Miami; 22-25, North Carolina, Wrightsville Beach; 28-July 3, Idaho, Pocatello; 30-July 3, Virginia, Lynchburg.

July—New Jersey; 13-14-15, Wisconsin, Milwaukee.

November—18, District of Columbia, George Washington University, Washington, D. C.; Arizona, Phoenix.

December—2-3-4, Ohio, Columbus; 10, Delaware, Wilmington.

Dates to be announced—Arkansas, Little Rock; California State; Louisiana, New Orleans; Montana, Great Falls; Oregon, Portland; Washington, Tacoma.

Classified Advertisements under this heading, $2.00 each for 60 words or less; additional space, 2 cents per word, single insertion; three insertions or more, special rate on application.

FOR SALE—Dental office in Colorado, electric equipment, in new railroad town, property booming, Dental prices high. Cash basis, running for year 1919, 5,000 dollars. Reason for selling will specialize in large city. For full particulars and price, address, 77, G. B., care Jones & Oaks Co., Mack Bldg., Denver, Colorado. 520P

FOR SALE—Completely equipped office in Grand Rapids Mich. In office building centrally located. A splendid opportunity. Inquire care of Ransom & Randolph Co., Grand Rapids Mich. 530C

FOR SALE—I must go to Colorado to live on account of illness in my family, and offer my office for sale at a very reasonable figure. Located in a fine Michigan town; doing a good practice. Equipment all that can be desired. Will discount my price $100 for quick sale. Address, 550C care The Dental Summary.

FOR SALE—One of the best located dental offices in Los Angeles, Calif. Semi-ethical practice. Exceptionally good equipment. Will bear closest investigation. Price and terms reasonable. Address, P-560, The Dental Summary.

WANTED—Efficient Dentist—Registered in Ohio, for large industrial office. State age, experience, religion and salary expected. Address, 540C care The Dental Summary.

WILL YOU BE ON EASY STREET long before the end of your productive years? Or, will you spend your declining years wishing you had been more ambitious and progressive? Do you want to become known as a wide awake, public spirited, successful dentist? Do you wish your name to go favorably into the best homes in your community? Then draw the attention of the public to the dangers of delay and neglect in caring for teeth. Why not mail us your check at once for $12.50 for 52 high class educational talks on teeth. Modern Publishing Co., Centralia, Ill. 510P

CUT THE COST OF GOLD CROWNS—Get better fees, do better work, save time, worry and patience. Use our seamless crowns as hundreds of others are doing.

Trial Assortment No. 2—Four cuspids, four bicuspids, four molars, one dozen, nineteen fifty; two dozen thirty eight dollars.

Trial Assortment No. 3—Six bicuspids, six molars, one dozen, twenty one fifty; two dozen, forty two dollars.

Trial Assortment No. 4—Two laterals, four cuspids, four bicuspids, two molars, one dozen, sixteen dollars; two dozen, thirty one dollars. All are 22K, thirty gauge. Fine for bridge work. State if you do not wish them polished. Money order or sent C. O. D. Order at once. Modern Dental Co., Centralia, Ill. 520P

X RAY A complete course of private instruction in DENTAL ROENTGENOLOGY is offered. Special attention to technic. Address

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THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL June 1920 No. 6

A NEW ATTACHMENT FOR PARTIAL PLATES*

BY L. E. CUSTER, A.M., D.D.S., DAYTON, OHIO

THIS RELATES to a new form of attachment for either upper or lower partial cases. Heretofore there have been four standard forms of attachments for such cases, namely: Griswold, Roach, Gilmore and Bischoff. While they have been more or less successful in a way, they are all still open to serious objections.

First, they all require the crowning of the teeth used as abutments.

Second, they all require in their construction the most precise technic to be found in prosthetic dentistry, any detail of which proving faulty usually causes ultimate failure of the entire scheme.

Third, they are not strictly hygienic.

Fourth, they do not allow wide individual movement of the abutment teeth.

Fifth, and very important, none of them have a wide latitude of spring so that future adjustments often are necessary and the life of the appliance is thereby seriously shortened.

That which I have to present is a form of attachment which at one stroke covers all the foregoing objections. Moreover it does not necessitate the crowning of any teeth. The technic is as simple as any procedure in dentistry. It is as hygienic as any dental fixture can be. It allows the widest individual movement of the abutment teeth and finally requires little or no subsequent adjustment.

The foregoing are broad claims, but a study of the principles and technic which I will now take up will amply sustain them. By attachment in this instance, we mean some device which will hold a partial dental fixture in its proper place in the mouth, using the natural teeth as supports. The appliance must of necessity have spring to it, which is the underlying principle of all forms of attachment. The appliance must be able to pass over the inequalities of the teeth both upon their surfaces and in their crooked positions and return to a state of rest where it holds the plate comfortably *in situ.* It will, therefore, be seen that the employment of a spring in cases with irregular teeth will require one with a very wide latitude of movement. It would ordinarily (unless the crowns are straightened by grinding) tax any metal to meet these conditions without soon crystallizing and breaking. This has heretofore been the chief problem in all clasp fixtures—to make a clasp within the confines of a dental plate with a wide latitude of spring without change of its molecular structure. The dentist has been confined entirely to the use of various alloys of the noble metals for use in the mouth. These unfortunately do not have the wide range of spring as does steel and the like. They may be bent just so far and no farther and return to their original positions; but beyond that the molecules change relations permanently and the spring does not return to its original position. We say "crystallization takes place," and if repeated the spring soon breaks at this point.

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*Presented at the Rehwinkel Dental Society, Chillicothe, Ohio, Feb. 28th, 1920.

My scheme, then, is to provide a metal clasp made of a noble metal which is not bulky and yet has a wide range of natural spring, so wide as to admit of all necessary spring without crystallization, and at the same time take up little room, and be hygienic.

The technic is this: Take an inch and a half of sixteen or eighteen-gauge round gold clasp wire; bend one end into a sharp crook, or solder a metal lug on the end to secure this end firmly in the vulcanite of the plate; now wrap around this just beyond the lug, two or more turns of vellum rubber about half an inch wide and vulcanize with other cases. Two complete turns of Daugherty vellum makes an average thickness.

A stock of these may be made up with different thicknesses and lengths of rubber for the different cases that present, bearing in mind that the thicker and longer the rubber covering, the wider may be the movements of the spring. The object in vulcanizing the vellum rubber first is that it will not flow or change its shape when vulcanizing other rubber around it. I am now able to secure a ready vulcanized vellum rubber tube from which I cut a piece and slip over the spring before waxing up. Vellum rubber may be vulcanized repeatedly without becoming hard.

I am advocating round clasp wire instead of flat for three reasons:

First, it can be bent in any direction when later on it is to be fitted to the tooth.

Second, caries does not occur under a round clasp as it sometimes does under a flat one.

Third, it is less noticeable when seen.

The model is struck up as usual. If both bicuspids remain on a side the pink rubber of the plate may be extended forward one-third the distance around the posterior buccal surface of the second bicuspid; otherwise a short piece of the clasp wire should take its place. The object of this is to firmly support the tooth buccally against our spring clasp which is to bear upon the lingual surface of the tooth. In so doing the abutment tooth is not moved in its socket when seating and removing the plate. The lingual spring is the only part that gives.

When the case has been waxed up, cut a deep groove in the lingual surface of the last tooth in the row to receive our spring clasp. Place the clasp as shown in *Fig. 2*, with the vellum rubber tight against the postero-proximal surface of the last tooth, bending the free end to fit approximately a short distance around the tooth; the rest of the end is to be covered with plaster when flasking so as to hold the clasp securely in place. The vellum rubber is now smoothed over with wax, being careful that it is embedded deeply enough to insure finishing the plate without being exposed.

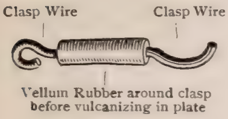

Fig. 1

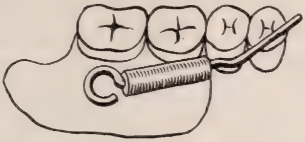

Fig. 2

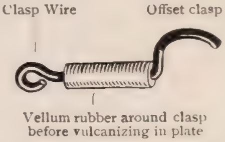

Fig. 3

Fig. 1—Plain clasp ready to embed in wax.
Fig. 2—Position clasp is embedded in wax for vulcanizing in plate.
Fig. 3—Offset clasp with vellum rubber covering, ready for waxing on case.

The case is now finished in the usual way and upon examination it will be found that our spring clasp does not touch the hard rubber anywhere except at its enlarged inner end where it is intended to be firmly held.

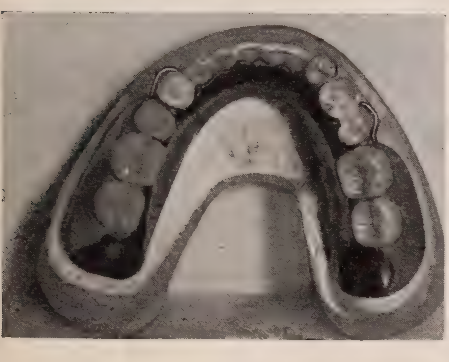

Fig. 4

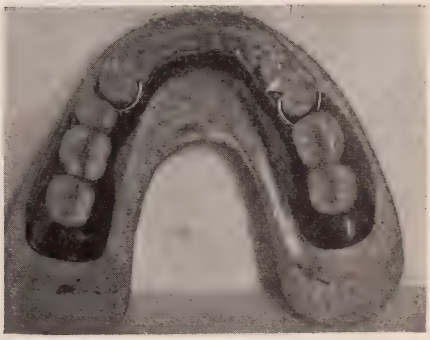

Fig. 5

Fig. 4—Showing offset clasps on buccal surface.
Fig. 5—Showing clasp on lingual surface operating against supports on buccal surface.

We now find that the wire as it protrudes from the plate may be sprung in any direction from one thirty-second of an inch to greater distances according to the thickness of the vellum rubber. This is due to the fact that the spring extends far back in the plate where it is grasped by the hard vulcanite. The vellum rubber while slightly aiding the spring is principally for hygienic purposes to fill in the space between the clasp and hard vulcanite yet yielding upon pressure. We now have a gold spring clasp with a flexibility of half an inch or more in length instead of one sixty-fourth of an inch or less as with the other appliances.

The case is now to be finally adjusted in the mouth. The surplus end of the spring is clipped off leaving the clasp to reach completely around the lingual surface of the tooth to the one forward of it. It should be bent up or down (being a round wire it will admit of this which flat ones do not) until it impinges just below the largest bulge of the enamel. The extreme end should now be made to bear hardest against the tooth, for in so doing the buccal support need not come so far forward. The extreme end of the support need only be diametrically opposite the point of the flexible spring on the opposite side.

In our complete plate we now have a fixture in which the supporting tooth or teeth are firmly sustained in place by the support on the outside and yet the plate is securely held in place by the long flexible clasps on the inside.

While I have used the typical lower case as an example, the scheme admits of such wide variation that it can be entirely reversed. The spring may just as well be used buccally as lingually. It may in extreme cases of long teeth be embedded well down on the alveolus and bent upright just as it emerges from the soft rubber as shown in *Fig. 4*. Here we get the additional value of torsion which gives an increased range of spring and the vellum rubber need not be so thick.

Summing up the entire scheme, the spring is firmly held at its inner end in the hard vulcanite the only place of rigidity, and is covered with soft vellum rubber the rest of its length which permits a wide latitude of spring in any direction.

28 No. Ludlow St.

ORAL RESTORATIONS

BY J. E. KURLANDER, D.D.S., CLEVELAND, OHIO

MALFORMATIONS of the oral cavity are much more prevalent than a majority of dentists know, and for various reasons it is a great pity that so many of the afflicted men and women do not get proper attention.

The great reason that so few of us care to do this work and thereby alleviate the suffering and misery of our unfortunate brethren is that very few dentists possess the necessary knowledge and skill.

If the dental colleges would attach more importance to, and give better instruction in prosthesis, it would be better than many things that we are instructed in, and which are absolutely useless. If more time could be given to, and better instruction given in the mechanical part of dentistry, better men would be the result.

What is dentistry? Is it not a fact that the very foundation is nothing more or less than mechanical, and should not a dentist receive instruction in mechanics sufficiently to make him fitted to do his own mechanical work instead of relying upon commercial dental laboratories?

It is a sad fact that today the commercial laboratory is a necessity to a majority of dentists. What would Atkinson, Miller, Butler, Black and others, too numerous to mention, say to the present condition in dentistry? The average dentist is really nothing more or less than an agent who takes orders to be filled by the commercial dental laboratories. Years ago when a patient came to a dentist he received the best service that the dentist himself was capable of offering. What is the condition today? He takes an impression, sends it to the dental laboratory and the laboratory returns the work. They never have seen the patient; do not know the countenance; know nothing of the anatomical condition; but make a set of teeth, the same as a cobbler, and return it to the dentist—and this is called the present-day dentistry.

Let us be frank with each other. I do not claim that the commercial dental laboratories are not useful, but I do say this: that the average dentist should receive at least as much instruction and know as much of prosthesis as the average mechanical dentist.

I have received probably in one year more instruction and knowledge by being associated with my father-in-law, Dr. Jaulusz, retired, than all the years I spent at school; and it is due the earnest instruction and good advice of Dr. Jaulusz that I am capable of accomplishing what I would hardly have been able to attempt immediately after my graduation.

In presenting this particular case to your readers, I hope I convey to them to the best of my ability, a method of remedying oral deformities by mechanical means.

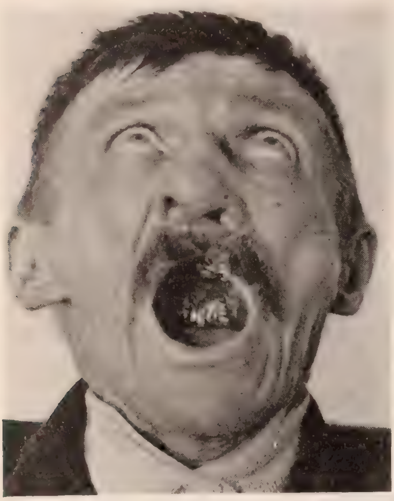

Fig. 1

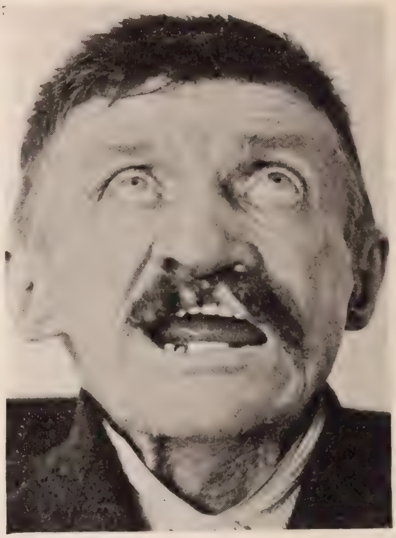

Fig. 2

Fig. 1, shows the palate of patient NN. The unfortunate man who heretofore was unable to speak or eat properly, being minus the uvula, thereby having considerable difficulty in deglutition, was obliged to swallow food in an unmasticated condition, thus causing him physical suffering.

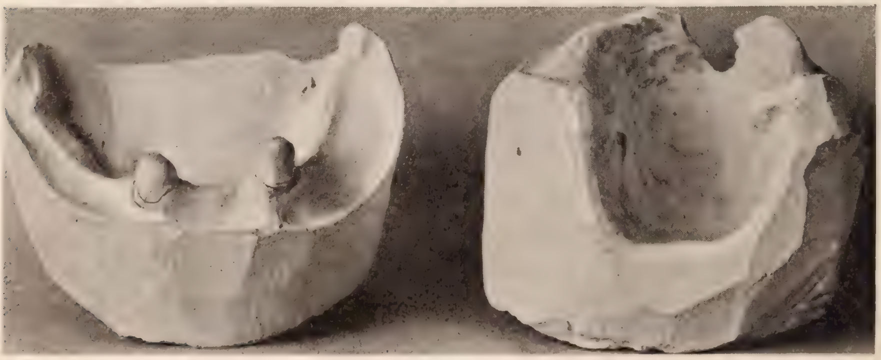

Fig. 3

Fig. 2 shows the completed denture as placed in the oral cavity.
Fig. 3 shows the plaster cast of the case.
Fig. 4 shows the appliance separated from the plate proper.
Fig. 5 shows it as it is placed in the oral cavity.

Fig. 6 shows patient without the plates inserted.

Fig. 7 shows the change of the countenance in expression.

Fig. 8 shows features after restoration.

I wish to call the attention of the readers of this article to the fact that this work is not more difficult than any other prosthetic work. However it requires mechanical ingenuity, care, and great patience. I very much regret that I am not able to describe the method of taking the impressions for this particular work, as it is too lengthy and could hardly be understood except by being seen. However, if any of my professional brethren desire instruction or information relative to this work I will be delighted to be of some service.

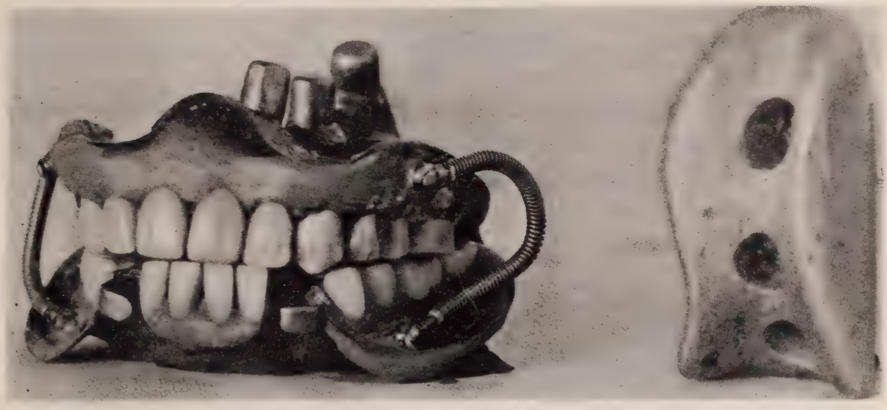

Fig. 4

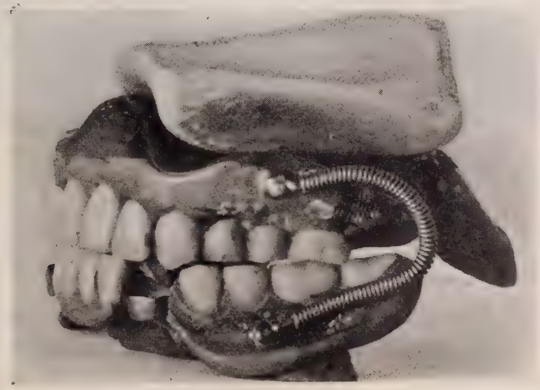

Fig. 5

The cause of malformation is various—whether it is a lack of lime, accidental or congenital. I may have my personal opinion as to the reason for so many cases of this nature, and I dare say that we have, in this country about fifty thousand such cases that need remedying very badly, but, owing to many being due to syphilitic conditions, these unfortunates do not receive proper correction by the dentists.

Many dentists complain of the danger connected with working on such patients, which is a fallacy, since syphilis in its tertiary stage possesses no danger to the operator; and I much prefer to work in the mouth of one who had the misfortune of having had an infection that had taken its course.

There is hardly a hamlet or a village but you find the so-called village fool, the boy with the hare-lip or the cleft palate, who is the victim of his progenitors. These cases should receive the very best attention. I believe that the greater half is caused by a syphilitic condition of the parents. It is called, in the flowery language, "blood disorder." When you contemplate that this condition prevails in our glorious republic and we are spending untold treasures for the betterment of cattle and horses, but neglect our human beings, it is appalling.

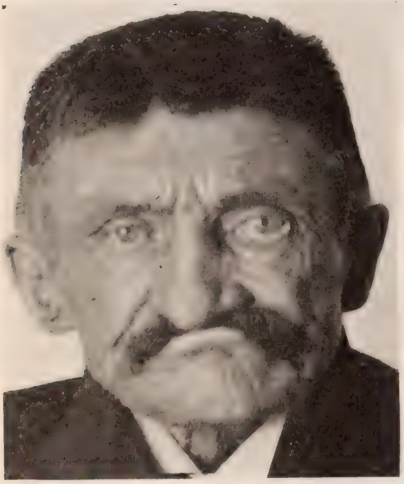

Fig. 6

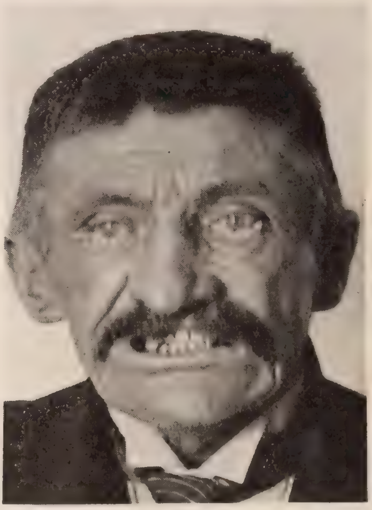

Fig. 7

This disease can be traced to the Romans, and it is high time for our authorities to do something to prevent the indiscriminate intermarriage of people suffering from this so-called "blood disorder."

I do not wish to preach against the teaching of religion in our schools, but if as much instruction were given to the physical care of the child as is given to its religious instruction, we would today have a better physical element and less misery and suffering.

How is the growing boy to be instructed of the dangers that are laid in his path or in the path of the young woman who is about to become the bride of one probably so infected? It is a sad condition, but having made a study of this subject, I know that the majority of the laity have no conception of what is really the present-day condition in many communities.

Let us see what are the remedies to prevent this condition. Is it elimination of the prostitute? No. Prostitution will live as long as men with natural desires live. The remedy is prevention and education, unlimited instruction, sex hygiene in the public schools, and not to permit boys and girls to grow up in utter ignorance and then cry when it is too late.

The life of a prostitute, according to Lombrossi, Ellis and other authorities, is but five years. However, what physical damage one prostitute may cause in a community in these five years is hardly conceivable.

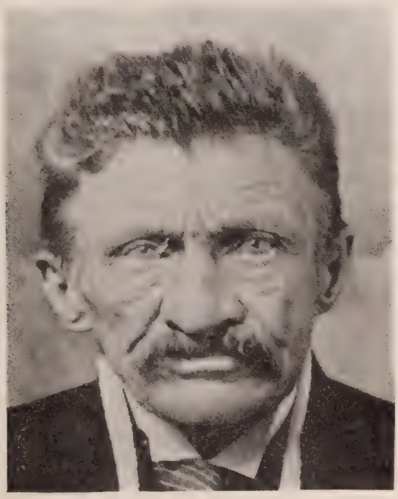

Fig. 8

God created man in his own image, but man despoiled this noble work with his utter indifference towards proper hygiene and care of the body.

My confreres should not judge that I am trying to preach morality; but probably no other man in any community has as much opportunity to do so much good as the dentist. The dentist has untold chances of speaking to his patient while working or discussing events during the time the patient is in his chair, and it is peculiar that a great many will discuss subjects of interest at such times; and I believe that the dentist should be looked upon not only as one who fills and extracts teeth, but a friend and advisor relative to the physical being of the patient—a counsellor in the matter of health. Especially should the children receive the instruction that ordinarily belongs to the physician, but it is somewhat strange that the children have more confidence in us and usually are afraid of the medical man.

In conclusion I will state that I trust the time is coming when our colleges will lay more stress upon the teaching of mechanical dentistry so that every dentist should be capable of doing work of this caliber although it may not be valuable from a financial standpoint. However, there is a reward in a satisfaction that is far beyond our compensation—and that is to do some good for our fellowman.

2182 E. 9th Street.

THE RELATIONSHIP OF VINCENT'S ORGANISMS TO PYORRHEA ALVEOLARIS

BY C. H. KILKER, M.D., CINCINNATI, OHIO
INTERNE, CINCINNATI GENERAL HOSPITAL

IN THE EARLY PART of the year 1919, night classes were organized in St. Louis among the dentists for the purpose of studying the organisms which are found in the mouth, and which are the cause of pathological conditions existing in the oral cavity. It was my privilege to instruct these classes in Bacteriology and it was through this course that this subject presented itself to me.

One of the requirements of the course was the examination of smears made from the various pathological conditions found in the mouth, prominent among which was pyorrhea alveolaris, and it was in the examination of these smears that the prevalence of Vincent's organisms was made manifest.

During the recent war Vincent's angina was very common among our soldiers, in fact, so much more common than formerly that mention was made of the prevalence of this disease in our camps. During this time no mention was made of any increase in the number of cases of Vincent's angina in civil life, although pyorrhea was still as prevalent as formerly.

Because of the apparent former rarity of Vincent's angina, it may be well to offer a word of explanation of this condition, in order to show how closely related it may be to pyorrhea.

Vincent's angina is a condition characterized by a white patch on the fauces, soft palate, or posterior aspect of the throat, resembling very much the diphtheritic patch, and in many instances causing retraction of the gums around the teeth, although the text-books lead us to believe that only at times do we get the gum retraction. The causative agent is either a curved, cigar-shaped bacillus, tapering at either end, and having definite cross striations, or a spirochæta, having a few loose whorls; or both the fusiform bacillus and the spirochæta.

Literature is rather confusing on this point, although Weaver and Tunnicliff have offered very good evidence to show that the fusiform bacillus and the spirochæta are merely different phases of the same organism.

Whether the causative agent of Vincent's angina be one or both, this fact remains true, that the fusiform bacillus and spirochæta are practically always found together.

Early in the course while examining smears from pyorrhea, we were astonished to find Vincent's organisms in a large percentage of cases. There could be no doubt as to this fact. Clinically these cases were pyorrhea alveolaris; yet bacteriologically the bacillus fusiformis and spirochæta Vincenti were very prevalent.

I do not wish to convey the impression that these organisms were found alone, for along with these were found the streptococcus pyogenes, staphylococcus pyogenes albus and aureus, and occasionally the pneumococcus and various bacilli. The question that suggested itself was "Which is the primary invader, the Vincent's organisms or the various cocci found in the mouth?"

It was about this time that a patient came to me with a sore throat and slight irritation of the gums around the molars. Examination revealed a white patch on the fauces and a very slight redness and inflammation of the gums around the teeth.

Bacteriological examination showed practically pure strains of Vincent's organisms, both in the mucous patch and in the inflamed area of the gums. Here the gum retraction undoubtedly was due to a Vincent's infection and a primary one.

This then was a Vincent's angina with gum retraction; and it is reasonable to suspect that if this process had been allowed to progress, we soon should have had a mixed infection, with the streptococcus and staphylococcus, which always are present in the mouth and throat; and then the picture would have been the same as in the numerous smears examined during the course in which we found the Vincent's organisms accompanied by various other micro-organisms, and clinically we should have the typical picture of pyorrhea alveolaris with the causative agent, primarily hard to determine, had we not been able to see the process at the start.

From this it is reasonable to expect that a certain number of cases of pyorrhea alveolaris start as a Vincent's angina with gum retraction, soon becoming a mixed infection; and then the treatment of these cases should be especially directed toward the destruction of the fusiform bacillus and spirochæta Vincenti.

Of the pyorrhea smears examined, twenty-five to thirty-five per cent. showed the Vincent's organisms, accompanied by various pyogenic bacteria.

Because of such a large number of these cases, I feel this should be reported and called to the attention of every practitioner, in order that he may investigate his individual cases, to ascertain the nature of the organisms causing the infection.

It is quite probable that the prevalence of retracted gums, due to Vincent's organisms found among our soldiers, was not because there were more cases of Vincent's angina in the army than among the civilians, but because there were more cases examined bacteriologically in the army than in private life, hence the greater number discovered.

A few years ago Bass and Johns did considerable work along these lines, in order to ascertain the cause of pyorrhea, with the result that several articles were written, in which they declared the endamœba buccalis to be the cause of pyorrhea. Later the belief became general and still prevails today, that the streptococcus, staphylococcus, and pneumococcus, their importance in the order named, were the chief cause of pyorrhea alveolaris.

In our work we found only a few cases of pyorrhea in which the amœba could be demonstrated, even with suitable stains. This however may be accounted for, since in not all cases were the smears taken from deep scraping of the peridental membrane, as Bass and Johns recommended.

Cultures upon agar, potato and bouillon made from the pyorrhea cases, showed in most instances the streptococcus and staphylococcus, even where the smear from the same case showed the Vincent's organisms in the mixed infection.

This fact is very easily explained, because of the difficulty with which the Vincent's organisms grow upon ordinary media, especially under ærobic conditions; the greater rapidity of the growth of the cocci group and the more profuse character of the growth in streptococcus and staphylococcus cultures, which would entirely prevent the growth of the Vincent's organisms.

The question now arises, "If the Vincent's organisms are the cause of pyorrhea alveolaris, why are they not found in all cases?"

It is quite probable that not all cases are caused by these organisms, yet a reasonable explanation may be offered. We know that in various infections, the presence of one micro-organism is detrimental to the growth of some other strain of micro-organism, therefore it is quite plausible, that many of these cases of pyorrhea alveolaris which start as a Vincent's infection soon become a mixed infection, in which the symbiotic action of the virulent streptococcus and staphylococcus is so detrimental as to entirely destroy the Vincent's organisms in some of the cases.

Considering the prevalence of pyorrhea alveolaris, especially among the poorer classes of people, I feel that the determination of the etiology of this condition is one of vital importance, and that there should be a bacteriological examination of every case in order to determine which cases show the Vincent's organisms.

I hope to be able in the near future to further verify the statements expressed in this article.

Cincinnati General Hospital.

VINCENT'S ANGINA OR TRENCH MOUTH

BY E. H. BRUENING, D.D.S., OMAHA, NEBRASKA

No matter what may be your favorite drug for the treatment of this disease, give your patient a syringe—the common, flat bulb, chip blower will do if you will enlarge the opening in the nozzle. Instruct him to make a normal salt solution by using eight ounces of hot water and 2.5 grs. sodium cholorid tablets. Have him syringe the mouth vigorously with this solution every hour and show him how to thoroughly wash it by throwing the solution about with the tongue and cheeks. He should keep up this treatment until the grayish membrane has disappeared; then before and after each meal will be enough. Office treatment once a day usually is sufficient, if this home treatment is carefully followed, to bring about the cure of an acute case in ten days.

We have been getting good results from the use of Dakin's solution. Many different antiseptics can be used.

Explain to the patient that his disease is infectious and he must not use towels, cups, etc. that others may use, before being washed, neither should he kiss anyone until he is cured.

First National Bank Building.

SOMNOFORM (ANESTHETIC MIXTURE) A NEGLECTED ANESTHETIC FOR ORAL SURGERY*

BY OEL E. LANPHEAR, D.D.S., KALAMAZOO, MICH.

WHEN MAN FOUND that the interfering pain, which hindered even the most skillful operation from even approximating good work, could be short-circuited, human life, liberty, and the pursuit of happiness were ushered into a new era, kaleidoscopic in its limitless variations. The field of human progress was immeasurably broadened with the discovery of anesthetics suitable for subduing any of the endless varieties of pains to which human flesh is heir. Nitrous oxid and oxygen was projected on the stage of Human Endeavor in the alleviative field of Medicine to play the stellar role. It was cast in the hero's part and the studious thinking minds of today pay tribute to its ability, though they seek an anesthetic which can be given with less strain to the anesthetist, one that can be handled without a complicated machine, one with easy access to the source of supply. The most distinguished minds of all ages have endeavored to aid surgery to obtain perfect operative results in the smallest amount of time, with the modicum of risk and discomfort both to patient and operator.

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*Read before the Section on Oral Surgery and Dentistry of the Interstate Association of Anesthetists, during the Fifth Annual Meeting, at Cincinnati, September 15-17, 1919.

A limited number of men have mastered the technic of the evanescent or rapidly-eliminated type of anesthetics. Few thoroughly understand nitrous oxid and oxygen and somnoform in their practical application and extreme value in the various fields of operative procedure, under the multitudinous taxing psychic and physical conditions, or seek to become past masters in their use.

The accursed apathy of the amateur anesthetist keeps him a tyro. He captures a single idea, puts it on a single track, or monorail, and endeavors to operate without a gyroscope or stabilizer. These single-track monorail anesthetists endeavor to create by word or otherwise oftentimes, (with their own lack of results as an example), many prejudices against the good work of nitrous oxid and oxygen and somnoform. Our many good, earnest workers along this special line should be safeguarded against these amateurs in this most fruitful field of professional endeavor. I am a very strong advocate of the meritorious, tested agents, and they should be upheld by the anesthetist.

FIELD OF NERVE BLOCKING

Local anesthesia produced by various chemical compounds of varying strength and osmotic tension are injected or projected into normal, inflamed and pathological human tissues with equal facility, to say nothing of the psychological and physical condition of the patient. Many of the misguided amateurs are injecting unknown drugs into unknown spaces with befogged ideas of the anatomical structures upon which they are operating, and erroneously terming the precedure "nerve blocking." The saner minds are seeking a reaction. They are endeavoring to create a predominance of sane, scientific, aseptic methods with due anatomical precision.

True nerve blocking by a skilled operator is to be endorsed. The nerve blocking anesthetist who inserts the needle into the deep tissues, blocking the various nerve trunks, including the extraoral and intraoral methods, must thoroughly understand what he is doing. He must possess a thorough knowledge of the anatomy of the parts he is injecting and must understand the true meaning of asepsis, as well as possessing a thorough knowledge of the physiologic and toxic action of the agent employed. Careless, infective and defective blocking should be universally discouraged.

ADVANTAGES OF SOMNOFORM

Close beside nitrous oxid and oxygen on our stage of Human Endeavor, we find somnoform in a star role of great worth. Somnoform most nearly approximates the ideal of the efficient anesthetic: simple equipment, ease of operation, speed of recovery of patient, uniformly good operative results. Somnoform is of great value in selective cases, for ease of operating, simplicity of machine and manipulation, comfort of patient, absence of venous swelling, speed of relaxation, speed of recovery, duration of narcosis and analgesia, and transportation facilities for remote territories.

Somnoform as used at the present time is composed of ethyl chlorid, eighty-three per cent.; methyl chlorid, sixteen per cent., and ethyl bromid, one per cent.

Quoting freely from DeFord, Henahan, Crile and others, anesthetic mixture is invaluable in facilitating the induction and obviating the long induction period of excitement for etherization. In operating on the upper air tract ethyl chlorid in combination is especially to be recommended because no asphyxia is developed. There is no sensation of suffocation, no cyanosis, no stertorous breathing, and if administered with percentage admixtures of atmospheric air, or oxygen, jactitation or spasm of the extremities of masseters rarely presents.

Rolland found in the combination of methyl chlorid, ethyl chlorid, and ethyl bromid an anesthetic which enters the circulation with practically the rapidity of oxygen, has an almost instantaneous effect on the nervous system and tissue cells, and on the cessation of its administration is equally as rapidly eliminated without causing any untoward complications.

PRELIMINARIES

If you please the patient comes without a full meal. She is ushered into the dressing room where a trained nurse assists in the preparation, which is physical and psychological. One point is, never allow her to be left to herself, on account of mental forebodings.

Henahan holds that the aim is to have the patient as comfortable as possible and completely relaxed. Attention should be paid to this, for if the patient remains tense with the muscles contracted the tendency is to become more so, requiring a much deeper and more prolonged anesthesia. At this point it is well for the anesthetist to reassure the patient that all the nurse has promised of the virtues of the anesthetic is perfectly correct, and that the outlook for the success of the operation is most promising. It is necessary also to come to an understanding with the patient regarding her respiration before inducing analgesia or anesthesia. Many persons carry a small volume of oxygen to the lungs at each inhalation and believe that their noses have little use for nasal breathing. Thus, little anesthetic mixture reaches the alveoli of the lungs. Observe carefully the volume of nasal breathing the patient does with the lips closed. The nose should be free and the patient convinced that he can breathe through the nose, especially when a nasal inhaler is used. While deep breathing is neither required nor desirable, moderate respiratory excursions are necessary for the proper induction and maintenance of anesthesia.

REPEATED ANESTHESIA

During oral operations it may become necessary to repeat the anesthetic at the same sitting because of foreign bodies getting beyond the barriers erected to keep them from the throat or various other reasons. When necessary to repeat the anesthetic at the same sitting, sufficient time should elapse for the patient to recover fully from the effects of the first administration; and at this time the mouth should be cleansed and care taken to control hemorrhage; if hemorrhage cannot be controlled by packing, the patient may be kept from swallowing blood by aspirating it mechanically. Continuous anesthesia is preferable to repeated administrations.

SIGNS OF ANESTHESIA

The signs of somnoform anesthesia are very easily worked out by the anesthetist who gives the vapor deliberately and notes the progress until he develops an "anesthetic sense of intuition," which will enable him to adapt the technic of administration not only to the given patient, but also to all the exigencies of the operative procedure in hand. The stages are apparently parallel and are similar to ether. Often the patient breathes very irregularly until he loses consciousness, when the rhythmic breathing begins. The pupils dilate, do not react to light, and the eyelids pressed against the cornea fail to produce reaction and the eyeballs become fixed.

METHOD OF ADMINISTRATION

Absolute care must be exercised from the beginning of the anesthetic until the nasal mask has been removed that none of the valuable anesthetic—anesthetic that has not reached the lungs—be allowed to escape. Operators must have well-adapted inhalers and handle the valve with precision. With the patient in readiness, we turn to one side and quietly break a capsule of somnoform on the gauze of the modified DeFord Inhaler, thus there is only somnoform vapor in the bag. Then deftly apply the inhaler to the face with the valve closed and a second capsule in place ready for snapping. Let only enough vapor escape at the first and second inhalations to anesthetize the olfactory nerve ends.

Then proceed with larger amounts, catching a part of each expiration and partly opening the valve for each inhalation until the bag is nearly full. It may be inadvisable to catch all of each exhalation. By the tenth inspiration the patient's entire breathing should be into the bag and the patient nearly ready for the operation. Endeavor so to use your anesthetic that you get a gradual progression into anesthesia from the first, disregarding the quantity of somnoform consumed. If we feel that one capsule will accomplish all work, very well. If intuition tells us that we are getting too much carbon dioxid in an individual case, we allow the patient to inhale from the bag and exhale into the atmosphere until the volume in the bag is lessened to any point we wish. Then we can break the reserve capsule. If conditions are right the anesthetist's assistant immediately inserts another tube. For prolonged anesthesia in oral operations we now exchange the face piece for the nasal piece, and so regulate our valves that we get free breathing enough to keep the patient narcotized. We should discourage the method so many use of carrying the patient through the preliminary stages at so rapid a pace that the anesthetist cannot note the important stages as the patient passes under. For this method often gives us a deeper narcosis than is required or necessary for the surgical operation at hand.

ANESTHETIZING CHILDREN

Oftentimes children present very trying cases when persuasion is of no avail. If the operating room with its many distracting influences is the last straw, or for other reasons it may be advisable to start our anesthetic in the anesthetic room by holding a small cotton roll saturated with oil of orange and ethyl chlorid under the nose while we are visiting with them, then we can proceed with the anesthetic of choice. Parents may wish that we work by force if necessary. If so, we close the valve in a Starck Inhaler, break one capsule of somnoform upon the gauze with the bag half full of pure oxygen, place a second capsule in position and put the face piece over the whole face and open the valve one-half of the opening. Endeavor to catch the next exhalation and then give the contents of bag until struggling is lessened. Then adjust the valve to secure a stage of anesthesia easily recognizable and proceed deliberately.

A DeFord Inhaler is easily modified to meet the requirements of an office by having an adapter just in front of the valve in such a position that it is very easy to interchange the nasal and mouth piece of a machine used in that office. Thus the rubber fittings are always in A1 condition.

AFTER-CARE

As soon as the operation is over and the patient can be left to his own resources, the gauze and inhaler should be removed and discarded, and the rubber bag and the various rubber attachments sterilized by dry heat and immersion in a bichlorid of mercury solution. Both sides of the bag should be thoroughly dried and powdered with soap-stone, all excess of the powder being then removed. Unless this is done the rubber bag and the air cushion will rapidly deteriorate. The metal parts of the appliance should be sterilized by boiling.

CONCLUSIONS

In a busy office a somnoform anesthesia can be given and the operation performed successfully with less time, skill, and patience than is necessary for a successful nerve blocking with fewer afterpains. Somnoform does not necessitate the anatomical knowledge demanded by local anesthesia. For minor operations at the bedside, somnoform is less cumbersome and more easily managed especially if the surgeon is called upon to perform the double role of anesthetist and surgeon, that is, for short operations like lancing a boil, extracting a tooth, or the short dressing of a wound. The anesthetic period allowed the operator with the analgesia period following is sufficient.

Hanselman Building.

FUNDAMENTALS OF OPERATIVE DENTISTRY*

BY W. H. O. MCGEHEE, M.D., D.D.S., CLEVELAND, OHIO

PROFESSOR OF OPERATIVE DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND SUPERINTENDENT OF CLINICS IN THE DENTAL SCHOOL OF WESTERN RESERVE UNIVERSITY.

MOUTH HYGIENE AND ORAL PROPHYLAXIS

THE MAJORITY of the operations which the dentist is called upon to perform at the present time are of a restorative nature. This is due largely to the fact that the public has not yet been educated as to the desirability of, and necessity for, strict cleanliness of the mouth and teeth at all times.

Since the advent of preventive medicine, the question of the necessity for educational propaganda along dental lines has received a marked impetus, and much good has been accomplished through the concerted efforts of the profession in the inauguration of oral hygiene campaigns. The well-worn saying: "A clean tooth never decays," is relatively true, and if patients could be made to realize the importance of maintaining absolute cleanliness of the soft tissues of the mouth, as well as of every surface of all the teeth of a denture, dental caries would be largely prevented.

If the time ever arrives when these conditions can be accomplished, it may be readily seen that the chief functions of the dentist of the future will be preventive, or prophylactic, rather than restorative in character. Many restorative operations will still, of necessity, have to be performed, even under these circumstances, and there will still be plenty of work of that nature to be done, but it will be much less in extent than at the present time, and secondary in importance to prophylactic operations.

The future in this regard lies largely in the hands of the dental profession, and it is incumbent on every member of that profession to realize that one of his chief duties is the education of his patients as to the importance of oral hygiene and its bearing on the health, mentality and morality of the community in which his activities lie. One of the chief duties of the dentist should be the discussion of matters of this nature with patients at the chair, as well as at public gatherings and in the press, when opportunities permit. Definite and detailed instructions should be given the patient, as to the proper methods of daily and regular cleansings of the oral cavity, mentioning *by name* the brush and dentifrice preferred, as well as describing the methods of their application. Mothers should be given definite instructions, as to the care of the teeth of their offspring, and the necessity of these procedures

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(*Continued from page 394, May SUMMARY).

should be fully explained, bringing out their bearing on the health of future generations.

98. Define *Mouth Hygiene.*

That branch of sanitary science which treats of the health of the mouth, and its preservation.

99. Define *Oral Prophylaxis.*

That branch of dental science which has for its object the preservation of the health and cleanliness of the oral cavity.

Preventive Dentistry.

100. Name the *Deposits* occurring in the mouth.

First, calculus (salivary and serumal).
Second, food debris (recent, fermenting, or putrefying).
Third, dead epithelial cells (from the mucous membrane).
Fourth, bacterial plaques.
Fifth, mucin.
Sixth, green stains.
Seventh, chromogenic bacterial stains.
Eighth, tobacco, tea, coffee and medicinal stains.

101. What are the *Local Results* of these deposits?

Caries, fetid breath, gingivitis, stomatitis, pyorrhea, pulp disease, alveolar abscess, pericementitis, osteitis, periosteitis, osteomyelitis, bone necrosis, diseases of the antrum.

102. What is meant by *Oral Sepsis?*

The general term used to designate the above pathological conditions, present in the mouth as a result of uncleanliness and infections.

103. What *Secondary Effects* may arise from deposits and septic conditions in the mouth?

First, throat affections; such as tonsilitis, pharyngitis, laryngitis, angina, diphtheria, abscess of the cervical glands.

Second, infections of the middle ear and otalgia.

Third, diseases of the eye; such as iritis, conjunctivitis, keratoscleritis, optic neuritis, strabismus, amblyopia, glaucoma, paralysis of accommodation, spasms of the muscles of the lids, paresis and many others.

Fourth, diseases of the stomach, intestines, respiratory apparatus and viscera; such as dyspepsia and indigestion, gastritis, constipation, diarrhea, abscess of the liver, pneumonia, bronchitis, tuberculosis and many others.

Fifth, general constitutional disturbances; such as lowered vitality, anemia, gout, rheumatism and the diseases of sub-oxydation, as well as abscesses, septicæmia, pyæmia and septic infections in general.

Sixth, reflex nervous disorders of the eye, ear, face and far-distant parts.

Seventh, *lowered mental vigor,* especially in children, as well as chorea, neurasthenia, epilepsy.

104. *What Conditions may Facilitate* the establishment and continuation of oral sepsis and its attendant disorders?

Irregularities of the teeth, unsanitary and poorly-constructed crowns and bridges, improperly-contoured and poorly-finished fillings, imperfect mastication, use of foods requiring little mastication, imperfectly-treated and filled canals.

105. *Through What Avenues* may infections in the mouth travel to distant parts?

By way of the blood, the lymphatic vessels and glands, along the mucous tracts (eustachian tube, etc.) the respiratory tract (inhalation), digestive tract (deglutition), fascia of muscles and by continuity of tissue.

106. What are the *Psychological Effects* of septic conditions in the mouth?

The development of vicious temper, untruthfulness, incorrigibility, degeneracy, melancholia, and criminal tendencies.

107. What is the *Treatment* for oral septic conditions?

Preventive and *curative.* The preventive treatment is as follows:

First, instruct patients as to the importance of the subject, bringing out its relation to the local and constitutional diseases mentioned.

Second, give them explicit directions as to the care of the mouth, mentioning definitely by name the proper brush and dentifrice to use, and how and when to use them.

Third, have them visit you at regular intervals for local treatment.

108. Name some prominent makes of *Tooth Brushes.*

Prophylactic, Rolling, Rubber-Set, Watkins.

109. Name some prominent *Tooth Powders.*

Graves', Lyons', Sanitol, S. S. White.

110. Mention some prominent *Mouth Washes* for general use.

Kolynos, Sanitol, Formalin, Pasteurine, Listerine, Liquor Antisepticus, Normal Saline Solution, Lime Water. The use of *acid* mouth washes, as recommended by Pickerill and others is contraindicated except in special cases.

111. Mention some prominent *Tooth Pastes.*

Colgate's, Kolynos, Pepsodent, Pebeco.

112. What is the objection to *Colored Dentifrices?*

The author of this book has reported an extensive series of experiments (*Dental Cosmos,* March, 1912), conducted both in the mouth and in the laboratory, which conclusively proved that colored dentifrices, constantly used, produce *discoloration of tooth structure*, and consequently should be abandoned.

113. Describe the *Toilet of the Mouth.*

First, brush the teeth and *gums* at least three, better four times a day.

Second, brush all surfaces of every tooth, paying special attention to occlusal surfaces of bicuspids and molars, lingual surfaces of all teeth and the wisdom teeth.

Third, brush with an *up and down*, as well as a cross-wise motion, reaching well into the interproximal embrasures.

Fourth, cleanse the *interproximal spaces* with floss silk.

Fifth, scrape the tongue with the brush or a *tongue scraper.*

Sixth, if the mouth and teeth are healthy and given regular attention, the use of a dentifrice is not necessary more than once a day.

Seventh, if regular and careful attention is not given, or if pathological conditions exist, use a colorless paste or powder and, in addition, gargle or spray the mouth and throat for several minutes with a colorless wash.

114. How often should a patient visit the dentist for *Prophylactic Work?*

At least twice, better three or four times a year; if specially subject to diseases of the soft tissues, still more frequently.

115. Name some prominent sets of *Scalers* for Prophylaxis Work.

Tompkins, Kirk, McCall, Hood (*Fig. 60*), Marshall, Abbott, D. D. Smith, Logan & Buckley, Carr, S. S. White and Ivory.

116. In what localities is *Salivary Calculus* found in largest amounts?

Opposite the mouths of the salivary glands, on the lingual surfaces of lower incisors (*Fig. 61*), and buccal surfaces of upper molars.

117. *What Variety* of Calculus is most harmful?

Serumal or sub-gingival calculus (*Fig. 62*), located at and under the free margin of the gums.

118. Describe the *Method of Removal* of deposits from the mouth.

First, rinse or spray the mouth with an antiseptic solution at the beginning and at intervals throughout the operation.

Second, remove the gross deposits with the larger size scalers; avoid injuring the enamel.

Third, with small scalers of suitable shape, remove the small deposits on the crowns and at the necks of all the teeth, working well under the gum, but avoiding wounding the soft tissues (*Fig. 63*).

Fourth, carry the small delicate scalers well to the bottom of any "pockets" present, scraping thoroughly the exposed cementum of affected roots.

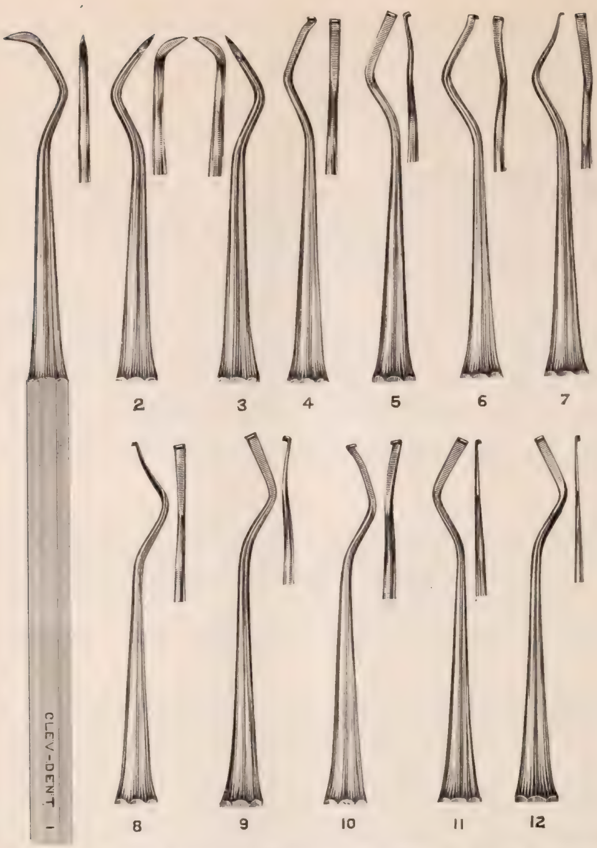

Fig. 60—Hood Scalers. Designed by Dr. J. Herbert Hood

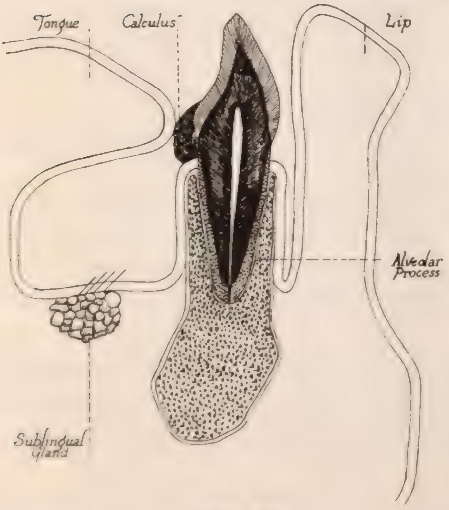

Fig. 61

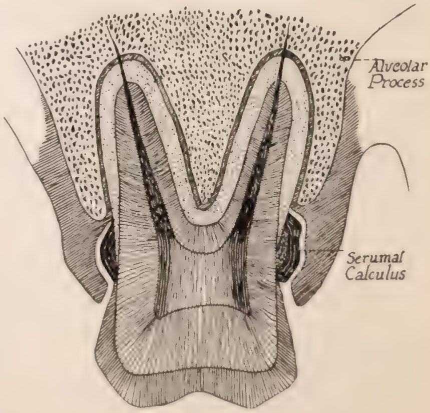

Fig. 62

Fig. 61 —Salivary calculus on lingual surface of lower central incisor.
Fig. 62—Serumal or sub-gingival calculus on a molar.

Fifth, with orange wood or basswood sticks, trimmed to suitable shapes and sizes, or wood points in a mandrel or porte polisher (*Fig. 64*), go over the surfaces of crowns and exposed roots and thoroughly smooth and polish them with a paste of pumice mixed with glycerine. Painting the teeth with tincture of iodin (disclosing stain) will exhibit to view any bacterial plaques present. Hydrogen dioxid will bleach and greatly assist in the removal of green and other stains.

Sixth, polish the proximal surfaces with ribbon dental floss (Cutter's) carrying the pumice mixture.

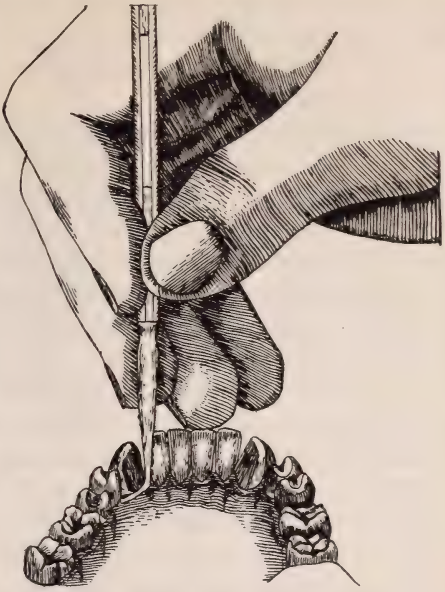

Fig. 63—Scaling calculus from the lower teeth.

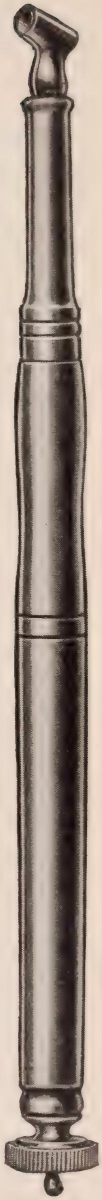

Fig. 64 Smith hand porte polisher.

Seventh, repeat the process of polishing with a finer polishing powder, such as oxid of tin or prepared chalk.

Dr. J. Herbert Hood, who designed the set of scalers illustrated in *Fig. 60*, offers the following instructions for their use in ordinary cases of prophylaxis work: (According to Dr. Hood, these scalers are intended primarily for the latter purpose, and are not designed to replace finer-pointed sets for work in the treatment of pyorrhea cases.)

"Beginning on the lingual surface of the lower right third molar with instrument number 9, proceed mesially until the cuspid is reached.

"Then use instruments numbers 1 and 7 on the lingual surfaces of the right cuspid, incisors, and left cuspid.

"Proceed distally with instrument number 5, on the lingual surfaces of the left bicuspids and molars.

"Beginning at the lower left third molar on the buccal surface with instrument number 9, proceed mesially to the left central.

"Proceed distally with instrument number 5, to the buccal surface of the lower right third molar.

"Beginning with instrument number 8 at the distolingual angle of the lower right third molar, proceed mesially to the right central.

"Proceed distally with instrument number 6, to the distolingual angle of the lower left third molar.

"Instruments numbers 2 and 3 may be used on the lingual surfaces of the six lower anterior teeth.

"Beginning with instrument number 8 on the distobuccal angle of the lower left third molar, proceed mesially to the left central.

"Then use instrument number 6 from the right central to the distobuccal angle of the lower right third molar.

"Beginning with instrument number 10 at the mesiolingual angle of the lower right third molar, proceed mesially to the right central.

"Then use instrument number 4, distally from the lower left central to the mesiolingual angle of the lower left third molar.

"Beginning with instrument number 10 at the mesiobuccal angle of the lower left third molar, proceed mesially to the left central.

"Then use instrument number 4, distally from the right central to the mesiobuccal angle of the lower right third molar.

"Beginning on the lingual surface of the upper right third molar with instrument number 5, proceed mesially to the right cuspid.

"Then use instrument number 7 on the lingual surfaces of the right cuspid, incisors, and left cuspid.

"Then proceed distally with instrument number 9, from the left cuspid to the upper left third molar.

"Beginning on the buccal surface of the upper left third molar with instrument number 5, proceed mesially to the left central.

"Then proceed distally with instrument number 9, from the right central to the upper right third molar.

"Beginning with instrument number 6 at the distolingual angle of the upper right third molar, proceed mesially to the right central.

"Then use instrument number 8, distally from the left central to the distolingual angle of the upper left third molar.

"Beginning with instrument number 6 on the distobuccal angle of the upper left third molar, proceed mesially to the left central.

"Then use instrument number 8 distally from the right central to the distobuccal angle of the upper right third molar.

"Beginning with instrument number 4 on the mesiolingual angle of the upper right third molar, proceed mesially to the right central.

"Then use instrument number 10, distally from the left central to the mesiolingual angle of the upper left third molar.

"Beginning with instrument number 4 on the mesiobuccal angle of the upper left third molar, proceed mesially to the left central.

"Then use instrument number 10, distally from the right central to the mesiobuccal angle of the upper right third molar.

"Instrument number 3 is to remove the salivary calculus from the upper right first molar.

"Instrument number 2 is to remove the salivary calculus from the upper left first molar.

"Instruments numbers 11 and 12 are used to remove serumal calculus from pockets."

119. What *Appliances may be Substituted* for orange wood sticks or wood points?

Bristle brushes and rubber cups on the engine, though not so efficient.

120. What *Additional Procedures* are advisable in case of the presence of pathological conditions of the gum and pericementum?

Massage, counter-irritation, cauterization, a prescription for an antiseptic mouth wash and frequently repeated treatments.

121. Name some *Counter-Irritants* and Caustics used for the purpose.

Tincture of iodin, iodin and glycerin equal parts, trichloracetic acid fifteen per cent., zinc chlorid (deliquesced), lactic acid full strength. Treatment of pathologic conditions of the gums and peridental membrane is fully discussed in the chapters on Diseases of the Gum and Pericementum.

The various Carmi-Lustro preparations, including Carmi-Lustro polishing powder, Carmi-cleaning powder, paste, tape, polishing wheels, and disclosing solution are valuable adjuncts in prophylaxis work.

Many dentists are recommending fine table salt (sodium chlorid) as a dentifrice, owing to its cleansing and antiseptic properties. The sprinkling of a small amount on the brush after using will also keep it sterile during the intervals between the cleansing operation. For these purposes a salt sprinkler may be conveniently kept ready for use. The modern trend of thought in this connection is to greatly minimize the value of the many highly-perfumed and colored dentifrices, so extensively advertised and lauded by their manufacturers.

If it were possible to accomplish a physiological cleansing of the oral cavity at all times, through a freely-flowing, healthy, alkaline saliva, and proper mastication of suitable foods, caries of the teeth would rarely occur. Since this is manifestly impossible, owing to our present methods of living, it is necessary to assist nature in her efforts by the adoption of artificial measures.

The author called the attention of the profession a number of years ago, in an article which appeared in The Dental Summary, to the fact that many of the lower animals are accustomed to the adoption of artificial cleansing measures in the mouth, through the action of the muscles of the lips, cheeks and tongue. The cleansing operation may be accomplished fairly well in this manner by the human being, in the absence of the brush.

Most of the proprietary dentifrices on the market today have some objectional qualities. Prominent among these are: *First*, the presence of too much soap, which on account of its alkalinity destroys the digestive ferments, and *second*, the incorporation of artificial coloring matter, to improve the appearance and increase the sale of the article. Mouth washes should be clear solutions, and powders and pastes should be as nearly white as possible, to prevent discoloration of tooth structure.

Regardless of the work which was done a number of years ago by the writer, dentists continue to recommend colored dentifrices to their patients, notwithstanding the undoubted harm which they do. Although the presence of numerous other detrimental components, such as potassium chlorate, in some of the widely-advertised oral preparations is recognized, dental practitioners are still allowing their patients to use them.

A dentifrice should possess the following qualities, viz.:

First, it should be cleansing in action.

Second, it should be of pleasant taste.

Third, it should be colorless.

Fourth, it should be non-caustic to the soft tissues.

Fifth, it should be mechanically and chemically non-abrasive to the enamel.

Sixth, it should be non-poisonous to the organism as a whole.

Seventh, it should be non-inhibitive on the secretion of saliva.

Eighth, it should be non-destructive to the salivary ferments.

Ninth, it should be very slightly alkaline in reaction.

It will be perceived that there are very few, if any preparations, on the market, which possess all of these qualifications. Those most nearly approaching them should be prescribed.

The following schedule would seem, at the present stage of our knowledge, to be a rational daily routine course of procedure to be recommended to patients.

A DAILY SCHEDULE

First, general hygienic measures. Maintenance of good health and bodily vigor through regular exercise, abundance of sunshine, fresh air, baths and similar measures. Avoidance of intestinal stasis, toxemia and similar conditions.

Second, diet. Daily and regular consumption of an abundance of *hard* water. Regulation of the protein and carbohydrate constituents of the dietary, according to the needs of the individual. Daily intake of a sufficient quantity of lime-containing foods. Inclusion of acid fruits in the dietary, especially at the beginning or end of a meal.

Third, "Fletcherizing." Thorough mastication of adequate quantities of coarse, dry foods.

Fourth, toilet of the mouth.

A. Absolute and continuous cleanliness of the mouth, through the systematic institution of an oral prophylactic regimen, by means of the brush, tooth pick, floss silk and similar measures.

B. Keep the tooth brush sterile by freely sprinkling it immediately after use with common table salt, which is allowed to remain until the next cleansing operation.

C. Regular use of a colorless dentifrice, containing as nearly as possible the ideal characteristics previously mentioned.

(*To be continued*)

NOTE—The articles by Dr. McGehee appearing in THE DENTAL SUMMARY are extracts from his forthcoming text-book, to be published early in the fall by The Ransom & Randolph Co.

PORCELAIN TECHNIC*

AS GIVEN BY DR. JESSE D. WHITE TO THE ST. LOUIS STUDY CLUB

NOTES COMPILED BY GEO. B. SCOTT, D.D.S., CHAIRMAN

IN THIS SUBJECT we are dealing with a branch of restorative dentistry that offers the greatest possibilities from an anatomical, physiological and esthetic standpoint; one in which we, as artisans, can exhibit our greatest skill. Next to a perfect natural tooth, is anything in the mouth more beautiful than a well-matched porcelain jacket crown, anatomically perfect; tolerated by the soft tissues; and harmonious as to shade and blending of colors? Even the defects of the neighboring teeth can be reproduced in the porcelain jacket crown, thereby bringing it into closer harmony with nature's own.

In the cycle of time, newer things are brought out, older things revived, and some of the very latest ideas tried, and either accepted or discarded according to their worth. But in the cycle, we also have stages of dementia, in which we try to apply certain materials, drugs or technic, to every case presenting; and, bubbling over with enthusiasm, hail this certain material, drug or technic as *the panacea* and blindly following, stumble along the road to—grief.

So it was with porcelain, some time since. By the many it was tried and applied in almost every case, conditions and contra-indications notwithstanding (to say nothing of an indifferent technic). Consequently, grief began piling up; and, of course, porcelain was "*absolutely no good*." There were some men, though, who studied the material—appreciating its possibilities and limitations—and gave quite some time to perfecting a technic of preparation, construction and application of the jacket crown; and they are the ones to whom we are indebted for our knowledge concerning this valuable material.

Each branch of dentistry has certain terms peculiarly applicable to that branch, ceramics not excepted, and one taking up any subject should become familiar with its terms. Let us take up and define those pertaining to porcelain work.

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*Read before the St. Louis Study Club, January, 1920, and before the St. Louis Society of Dental Science, February, 1920.

Dental Porcelain (hard porcelain) — A solidified suspension of one or more unfused, silicious substances in a fused silicate.

One-Grade Porcelain—Any porcelain that can be used for both body and enamel.

Two-Grade Porcelain—The enamel fusing at a lower temperature than the foundation body.

Block Body—Any body fusing at or above the fusing point of an American-made tooth. (2440 degrees F.).

High-Fusing Body—Any body fusing at or above the fusing point of pure gold, (1945 degrees F., U. S. Bureau of Standards) up to that of an American-made tooth.

Low-Fusing Body—Those bodies fusing below the fusing point of pure gold.

Firing—The fusing of the porcelain in the furnace.

Soft Biscuit—Materials fluxed together. Permits carving. All shrinkage has not taken place.

Hard Biscuit—Fusion has taken place—almost to vitrification.

High Biscuit—Final vitrification with pebbly surface—full shrinkage.

Silex—Coarse sand.

Kaolin (or clay)—A hydrated silicate of alumina.

Feldspar—A double silicate of aluminum and potassium.

Silica—The dioxid of silicon.

Flux—The salts of sodium and potassium, used to lower the fusing points. The carbonate of alkaline metals.

Pigment—The coloring matter of porcelain.

Frit—The colors prepared for the enamels. Consists of a pigment mixed with feldspar and flux, ground fine, fused into a glass and then reground.

Foundation—Contains a small amount of flux—higher fusing than enamel.

Enamel—Same as porcelain.

Glaze—Final finish.

Let us consider the materials. We all know that there are on the market numerous porcelains; and that the fusing points of these various makes cover a very wide range of temperature; so they are divided into three classes, viz., Block Body, High Fusing, and Low Fusing. The fusing points as given by the manufacturers are:

Twentieth Century, 2624; Consolidated, 2624; Justi H. F., 2440; Ash tooth body, 2240; S. S. White Block Body, 2560; S. S. White H.

F., 2300; Jenkin's Prosthetic (L. F.), 1850; Jenkin's Inlay Body, 1544; Brewster's Foundation, 2300; Brewster's Enamel, 2100; Brewster's Transparent, 1945; Fellowship Mouldable, 1850; Roach Mouldable, 1850; Peck's Enamel Paste (for glazing inlays), about 1945.

We can see by the foregoing list that there is quite a range of temperature between the lowest and the highest fusing points. So let us get down to the reason, and at the same time understand something about the makeup of the various bodies.

The materials entering into dental porcelain are, feldspar, silica, kaolin, alkalies or flux, and pigments.

Feldspar—A double silicate of aluminum and potassium. This material is somwehat less refractory than silica, and is incorporated for the purpose of imparting stability to, and increasing the translucency of the compound.

Silica—Dioxid of silicon, a very refractory and practically infusible substance, found in the form of agate and flint. It is the base of all true porcelain "bodies," and imparts structural strength to them.

Kaolin—The hydrated silicate of aluminum. This is a very fine grade of clay, and is a most essential ingredient, being incorporated for the purpose of imparting stability of form by holding the particles together, and thus facilitating the moulding and carving of the mass into the desired shape.

Flux (Alkalies)—The carbonates of the alkaline metals, sodium and potassium, though in some classes of compounds the oxid of lead is much used. These salts are soluble in the fluids of the mouth, consequently the greater the amount used, the more unstable the product.

Pigment—The coloring matter of porcelain.

The oxids of titanium, cobalt, iron and tin; gold as an oxid and in the metallic state, and platinum as a precipitate, are used.

Titanium oxid is used in the body, imparting a creamy, yellow color of dentin and enamel.

Cobalt oxid produces the blue tints. Iron oxid is used for some of the browns. The oxids of tin and gold form purple of cassius, producing gum pink.

Metallic gold for reddish brown colors; platinum gives us a gray tint.

You will note that a flux is used in the composition of porcelain and that by increasing the quantity, the fusibility is likewise increased; hence, a high-fusing porcelain can be changed into a low-fusing, by adding flux. In the very low-fusing bodies, lead oxid has been used as a fluxing material, but since this is subject to the action of the oral fluids, to a great extent, the porcelain soon becomes mottled with black specks.

The high-fusing bodies have more translucency than the lower-fusing, because of the smaller amount of flux contained, and which burns out to some extent. Therefore, the higher-fusing porcelains are more porous. This porosity also may be caused by over-baking or by too-rapid fusing. The greater amount of flux contained in the low-fusing bodies, brings about a more homogeneous mass. This brings up the subject of shrinkage, and explains why the low fusing has a shrinkage ranging fifteen per cent. to twenty-five per cent.; high fusing five per cent. to fifteen per cent.; while the block body will run between three per cent. and five per cent., depending on how tightly it is packed. In the mixing of the various porcelains, distilled water should be used with the high fusing, and alcohol with the low fusing.

One can hardly expect to do this class of work without the necessary equipment, so the instruments and materials contained in the following list are recommended:

Carving and packing instrument; Burnishers, Thompson's Nos. 1, 2, 3 and 4, (Justi); Crandall's chisels, Nos. 10 and 11, (Cleve. Dent.); Weaver's enamel cleavers; Towner prophylactic files, (twelve to set), Nos. 6 and 8, (Ivory); Ivory marginal trimmers; Caulk's amalgam carvers; Jenkin's porcelain prosthetic brushes, No. 4; fine needle-point callipers, (bent point); cataract lance; three-compartment artist slab; architect's ink holder; Justi sample shade holder; Blue Island seamless band, (long); Miller's separating discs, 701, 702, 711, 712, 731, 732, 741, 742; Miller's mounted points, 26, 27, 29, 30, 31½, 68, 69, 44, 28, 28½, 40, 34, 35, 36, 70, (for straight and right angle hand piece); end cutting burs; Nyman's saliva ejectors, (R. & L.); Nyman's deflectors; Hare mouth prop.

Now that we understand to a certain degree, the materials entering into the makeup of porcelain, the difference between the various grades and their fusing points; have become familiar with a few of the terms used in connection with this work, and have gone over the list of the necessary instruments and equipment, we will take up the preparation and construction of the porcelain crown.

PORCELAIN JACKET CROWN

Indications—Any of the ten anterior teeth, upper or lower; discolored teeth; teeth in which there are several fillings; malformed and malposed teeth; and in all of these the pulp can be preserved, unless in a pathological condition.

Requirements—Form, contour, contact, size, color, adaptation and body.

Preparation—The first step in our tooth preparation is to trim off the proximal surfaces so that these walls converge toward the incisal. This is done with a safe-side disc, cutting down from the incisal to the gingival. The next is cutting down the incisal surface (at least to the dentin), to allow for sufficient bulk of porcelain. With round or square-edge stone, remove the enamel from the labial and from the lingual, completing a true cone preparation. (One precaution—always keep the stones and tooth wet with hot water. A good way to do this is, attach a Dunham water heater to the drinking fount of the cuspidor, and with a rubber tube and nozzle attached, a constant flow of hot water can be directed upon the work. This heater is a small electric affair, and a very good idea). With the enamel cleavers the ledge of the enamel beneath the free margin of the gum is removed, and the Towner files brought into use for removing any remaining spiculæ of enamel and smoothing the subgingival preparation.

A measurement is taken and two long seamless copper bands (Blue Island) fitted to the tooth; trimming the cervical edge of the band to follow the gingival contour and marking the labial surface, that it may be identified readily. Fitting the bands at this stage of the preparation is far easier than at a later stage, as one has not the shoulder to contend with. These bands are laid aside until the tooth is prepared and ready for the preparation. With inverted cone stones, (No. 70) a groove is cut entirely around the tooth (at the gingival) to a depth of about one millimeter, and the balance of the crown ground down to a conical form ending at the shoulder. End cutting burs will carry this shoulder beneath the free margin of the gum, and with Crandall's instruments Nos. 10 and 11 true up and sharpen the angles. On the labial and lingual, this shoulder should meet the body of the tooth at an angle of about seventy-five degrees, establishing a firm seat for the finished crown. With sandpaper discs polish the preparation.

Badly Broken-down Teeth—Not infrequently, it will be necessary to build up a tooth so that we can make our preparation, and for this purpose Lee S. Smith's white copper cement is used. Always bear in mind that the shoulder must be in solid tooth substance, and when caries has progressed beneath the free margin of the gum, our preparation must extend to the point where sound structures will form the margins—*except* in devitalized teeth, where there has been almost a complete destruction of the crown, and decay has progressed quite some way beneath the gingiva, cut down the tooth to solid substance, insert a dowel into the canal, and with the shoulder in the wax where necessary. Cast this in gold or coin silver and cement in place.

Impression—We have our two copper bands that were laid aside. These are filled with modeling compound and an impression of the preparation made. When the bands were fitted a mark was made on the labial surface of each; be sure they are in this position when taking the impression. The band should be filled even-full of modeling compound, the finger moistened or coated with vaseline and the band forced into place; make sure that you have forced it beyond the shoulder. The excess compound will force the gingival tissue back, giving us a sharp impression of the shoulder. When the band has been pressed into place remove slightly to break any adhesion of the compound with the tooth; then force back again, holding with firm pressure until compound has chilled. Remove and trim away the excess compound that has been forced out at the gingival. The same steps are followed in securing the impression in the second band.

Shade and Individual Markings—Do not try to select the shades or coloring on a dark or murky day, or by artificial light, but select a time when the natural lighting is good. Match the shades as blended in the neighboring teeth, or its fellow on the opposite side. Make a rough sketch of the outline of the crown and block it off into squares, marking in its proper place any defect or individual markings that will bring the finished crown into closer harmony with the other teeth, noting color, defects, stains, etc.

Impressions and Working Casts—We have the two copper bands, containing the impressions of our tooth. One of these is replaced on the tooth, noting particularly that it is firmly seated, and then a modeling compound impression is taken. (For all anterior work have the impression take in the bicuspids to assist in occlusion). Let this compound thoroughly chill, then remove, bring the band that was replaced upon the tooth with it. A compound impression of the occluding teeth is taken, covering the same range of arch as the other impressions. Note the occlusion and take a thin wax bite.

Protecting Tooth—Temporary—A tooth prepared in this manner will be extremely sensitive to thermal changes, and it would be hardly fair to a patient to dismiss him for several days without some means of protection for the denuded dentin and a temporary restoration. A coating of saturated solution of patassium carbonate will prevent this sensitiveness, and a temporary restoration of synthetic porcelain will have a better esthetic effect than the preparation. To make a temporary crown, coat the tooth with cocoa butter, select a celluloid tooth form, fill with synthetic porcelain and press into position. When the porcelain has crystallized, remove, trim away the excess and wipe off the tooth. Cement to place with temporary stopping.

Amalgam Model and Working Casts—You will remember that two impressions of the preparation were taken, one placed on the tooth and taken with the compound impression, and the other set aside. This second band is now wrapped with heavy writing paper so that the paper will form a tube projecting about three-quarters of an inch beyond the cervical edge of the band and tied with dental floss. This is now packed with copper amalgam or Harper's alloy, (the latter if you are in a hurry), and when thoroughly set, remove from the band and trim to the conical form of the root. Let the surfaces of this root be parallel for five or six millimeters below the shoulder and then taper off to the apical end. Cut a grove along the labial surface of the root, parallel with the long axis, as a guide for replacing the working cast.

There is a degree of uncertainty in placing any parts in an impression and getting the absolute relation as in the mouth, so right here I want to give credit to Dr. J. D. White for a method that will eliminate this uncertainty. One impression of the tooth was replaced and removed with the impression of the case; so into this is placed the amalgam tooth, the root of which has been chilled or coated with cocoa butter and the impression poured up. The opposing cast should be made of Spence compound or Weinstein's artificial stone.

We now have our working model of plaster, with an amalgam replica of the tooth preparation in position. Trim the plaster from the interproximal spaces and cut down the gingival, exposing the amalgam root about five or six millimeters below the shoulder, so that it can be replaced without distorting or interfering with the matrix. In removing the plaster from the interproximal spaces between the metal preparation and the adjoining teeth, be very careful that the contact points on these adjoining teeth are not destroyed, as we need them to gauge the mesiodistal diameter of our crown.

Plaster will absorb moisture, so our cast must be treated in some way to prevent its absorbing the moisture from our porcelain. This can be done by coating with acetone or amyl acetate; but a more efficient method, for which we are indebted to Dr. White, is to coat or soak in cocoa butter. Not only does this render the plaster impervious to moisture, but gives it a glazed finish as well; and, if soaked, the cocoa butter makes the plaster very hard, preventing easy fracture.

Matrix—Platinum foil of one one-thousandth thickness is used as matrix material, and as it is rather expensive, should be cut so that there is a minimum of waste. The most economical way of cutting is to buy it in a one-pennyweight piece, split into two strips and then cut each strip into diamond-shaped pieces. You should get six or eight matrices from a pennyweight.

The matrix is adapted from the labial, pressing around the proximal surface. Cut down each side of the incisal excess so that there will be a fold to burnish over the incisal edge and down into the lingual. The free ends are brought around into the lingual, drawn taut with foil pliers and fastened with a tinner's joint. This joint is made by bending the excess of foil at right angles to the lingual surface, pinching together with the foil or cotton pliers and trimming off until there is but three millimeters of excess. Fold this back on itself until the free edges are touching lingual of the matrix, and then fold down against the matrix surface, thus making a double fold. Trim off the excess beyond the incisal edge and burnish. Remove the matrix to make sure that it will not bind, replace and burnish out smoothly. The Thompson burnishers are used for burnishing and ironing the matrix to close adaption to the shoulder.

On the lingual, the joint extending down to and over the shoulder gives us five thicknesses of platinum, and as this is part of our margin, we desire very close adaption of our finished work. So with small, fine stones, grind down this joint until there is but one thickness of foil;

then iron out thoroughly. Remove matrix (holding carefully) and trim off some of the cervical excess, leaving a flange about five millimeters wide. This will form a base for the crown to rest on during the baking operation.

Those who are not familiar with handling the platinum foil will find this a rather tedious operation, but close application to the details of this technic will soon result in their mastering the finer points. I would suggest that number twenty tinfoil be used for practice, as it is less expensive, and while it is more frail than the platinum and very easily torn, it will teach one to be careful. When the handling of the tinfoil is mastered, the platinum will be comparatively easy.

Packing the Porcelain—We already have selected on the Justi guide the shade of the tooth to be reproduced. In the Justi H. F. Porcelain Case will be found a list giving the numbers of the various teeth on the shade guide, with their corresponding numbers of the porcelain powders. This reduces to a minimum the element of chance in our color selection and makes possible an exact reproduction of the shade and blending of colors of the natural tooth; so the balance lies with us in our ability to apply these colors.

In our earlier notes the shrinkage on high-fusing porcelain was given as ranging from five per cent. to fifteen per cent., depending upon how tightly the porcelain was packed. So it behooves us to eliminate as much of this shrinkage as possible by tightly and firmly packing our porcelain into the matrix.

What shrinkage we will have is very apt to distort the margins (shoulder) of our matrix, unless some precaution or steps are taken to prevent it. There are several methods by which this can be done, all of which are efficient. By flowing over the shoulder a thin film of inlay wax; covering the shoulder with sandarac varnish, or trimming out the porcelain before the first bake.

With the amalgam tooth and matrix in position on the working model, select the gingival color and place a small quantity on the slab, mixing with distilled water. Absorb the excess of water with a J. & J. napkin or bibulous paper, and with a folded napkin hold tightly against the lingual surface, pack the porcelain into the interproximal spaces and on the labial, building over the incisal edge. Reverse the model, placing the napkin in the labial and packing the lingual.

Pack this on as tightly as possible to reduce the shrinkage. After we have the gingival color built on, trim away the excess, leaving it possibly a little more full than the dentin of the tooth would be, except in the gingival third, where it should be built on full contour. Smooth this first packing with sable brushes, and mix the incisal color. This is applied in the same manner, packing tightly, except that it should be built to full contour and shade out in the gingival third of the crown. The blending of the colors at this point is brought about by moistening a small sable brush and working the colors together. Trim away the excess, carve the grooves and fossa on the lingual, reproducing the marginal ridges and labial developmental grooves.

Baking—The baking operation as it is today may be considered a comparatively easy task, as all furnaces can be had equipped with a pyrometer. It is necessary though that one learn his furnace, as there may be some variation even of those of the same make; a difference in the registration of the pyrometer, especially in a new furnace. The older porcelain workers have by close application so trained their eyes that the color within the muffle will indicate an approximate temperature; but it takes quite some time to train yourself in this, and it is hardly necessary with a pyrometer-equipped furnace.

To test your furnace, make a number of small cones of a known porcelain (the kind you intend using), and bake them separately to various degrees to determine at just what point you should cut off the heat for soft, hard, high biscuit and glazing. After you have familiarized yourself in this, you are ready for the first baking of your crown.

Carefully place the crown upon a fire-clay tray, the crown resting upon the base of the matrix, and place in the muffle, as near the center as possible. Close the door and turn on the current, the lever on the first button. Allow the pyrometer gauge to register fourteen hundred degrees F. and then begin to jump the regulator lever, moving one button at a time. You can follow the pyrometer, jumping one button for each one hundred and fifty degrees of heat, or allowing two minutes on each button, until the desired heat is indicated, then drop the lever back to the first button and cut off the current. Allow the crown to cool off in the muffle, as changing the temperature will crack and craze it. The first baking should be what is known as high biscuit, which is just short of glazing. At this stage all shrinkage has taken place and it presents a pebbly surface resembling salt or sleet.

When the crown has cooled off place upon the amalgam model and reburnish the matrix at the shoulder; replace in the working model and pack in around the shoulder; also add any porcelain to fill out contour and size reduced by shrinkage in the first baking. Brush out smooth, blending the colors in the gingival third and removing any excess of porcelain on the matrix apron. Rebake to high biscuit, cooling in the furnace.

After the second baking, replace on the amalgam model and try in working model. All necessary alterations and corrections are made at this stage. Correcting the occlusion, contour, contact, etc., and grinding off excess of matrix and porcelain at shoulder, leaving a smooth joint without any overhang whatever. (Keep crown and stones wet while grinding). Rebake, this time bringing it to a glazed surface.

When the patient returns, test this in the mouth (with matrix still in position in crown). If any extensive grinding is necessary it should be rebaked, but if not, the crown is ready for setting after matrix is removed.

To remove matrix, start at the shoulder, carefully loosening all around and rolling away from the edge of the porcelain. When started, immerse in water, after which it will separate from the crown.

It might be well to embed the crown in modeling compound before starting this part of the work, as great care must be taken in handling the porcelain for fear of crushing. Any particles adhering in the incisal portion of the crown may be removed with a small inverted cone bur.

Set the crown with cement, mixing thin and gently rocking to place, holding until cement has crystallized. Never try to force or drive, else a fracture of the porcelain will result. Explorers and fine strips are used to remove any excess of cement below the gingival margin.

Wall Building.

AN ANTERIOR PORCELAIN ROOT BRIDGE WITH THREE-QUARTER CROWN ABUTMENT*

.E. R. HART, INSTRUCTOR

REPORT BY DR. O. PAQUIN, JR., CHAIRMAN, ST. LOUIS, MO.

IN STARTING in on this bridge our first consideration was to the length of the root of the tooth to be used as the abutment, its direction, and also the length of the root of the adjacent tooth, which is of course in such condition that it will be extracted before the bridge is ready to be placed in position. We were told, and it was demonstrated to us, how necessary and essential in all dental operations is the use of a radiograph of the teeth in question so that we could have a good idea of the outline of the pulp chamber in the cuspid, the direction of the roots of the two teeth, and the condition of the process surrounding them.

PREPARATION OF THE ABUTMENT

The preparation used was for an attachment commonly known as a three-quarter crown, called by some the three-quarter inlay crown, this character of support being the most ideal because of its being so sanitary and constructed with very little destruction of tooth structure, and at the same time having the greatest strength possible for support and the least possible chance of any irritation of the pulp.

Our first step in the preparation of the abutment was to make a cut on the mesial with a safe-side flat disc, cutting down from the incisal to the gingival on a parallel with the center of the crown of the tooth. This first cut is carried down past the approximal contact of the tooth and varies in depth according to the shape and general outline of the crown, so as to give sufficient extension on the labial for the cleansing of the margins and on the gingival for a very slight shoulder. Next comes the second cut, which is made by a slight rotation of the handpiece on the lingual to bring our preparation over onto the mesiolingual angle.

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*Read before the St. Louis Study Club, January, 1920.

On the distal the preparation is the same, only a safe inside saucer-shaped disc is used for cutting through the contact. After we have made these two cuts our next move is to ascertain whether or not the two cuts are absolutely parallel. If they are not parallel there is bound to be some distortion of the wax pattern when it is removed from the tooth, and for this reason I believe that there should be a slight tapering towards the incisal of the tooth if this can be done without any irritation to the pulp.

Next we used a small tapered fissure-shaped, mounted stone, and our preparations on the mesial and distal were brought together on the lingual and a slight shoulder was thereby produced along the gingival. This shoulder is very shallow and is only made so that we could get a definite outline for our margins rather than for a "seat" for our inlay. In using the carborundum stones it was suggested by Dr. Hart that stones for the contra-angle handpiece be used in the straight Doriot handpiece, in order that the stones would run more true and so that we would have greater control in our cavity preparation. The lingual surface of the tooth from gingival to incisal is next trimmed down with small mounted stones so that a bevel will be produced just enough to allow for the thickness for casting. The gingival outline running from mesial and distal is bevelled at this same time. Parallel grooves are then cut on the mesial and distal, running from the proximo-incisal angle back of the labial enamel plate, towards the gingival, until the preparation at the shoulder is reached, and then a cut is made on the incisal connecting up these two parallel grooves. If the incisal edge of the tooth is imperfect in any way, our preparation here must be changed to remedy the trouble, whether it be due to attrition, or abrasion, or decay. This distinct groove which is formed on the mesial, distal and incisal, acts as a guide in bringing the finished inlay to place and also prevents any dislodgment.

As I have mentioned before, it is absolutely necessary that the grooves on the mesial and distal be perfectly parallel, and also that the finished cuts on the mesial and distal be parallel, otherwise there will be great distortion of the wax when it is removed.

WAX TECHNIC AND CASTING

Either the direct or direct-indirect methods can be used. Some have better success with simply using the direct method. A simple method to get good adaptation to the walls of the cavity is to use a strip of china silk, which is passed around the wax and twisted together over the labial surface of the tooth, then follow up by burnishing on the mesial and distal to bring out the contact points properly. We were taught to use the direct-indirect method in this work, chiefly because of the fact that this method permits us to get a more perfect view of the work of waxing up and carving. A wax pattern is made as described in the direct method simply to aid us in getting the occlusion and contact points, and then a copper band is made for the tooth slightly longer and of larger dimension, and warm modeling compound is placed therein and forced to place on the tooth, and then chilled while the pressure is maintained. This constant pressure is important so as to prevent any movement of the impression which would cause distortion.

The usual steps of investing the impression in plaster and running up the amalgam die were then gone through with. We were careful to sink our impression down deep enough in the plaster so that there would be plenty of bulk to the amalgam die to enable us to handle it easily in waxing up.

After our die had been removed from the plaster it was cleaned thoroughly and then coated with glycerin or sweet oil, and then the wax pattern we had made was placed in the die and carved, paying especial attention to the contact points and the margins. One of the things we had impressed upon us in this connection was to carve all our wax margins "plus," as it is much easier to trim down the margins of the finished casting than it is to trim our wax "minus" and then try and perform a miracle in burnishing after the inlay is finished.

When we have finished the carving our pattern is removed very carefully and given a bath in Acetone, and then invested and cast. The casting is made either with Ney Oro "C" Casting Gold or Hart's Gold. The gold made up by the St. Louis Dental Manufacturing Company after the formula of Dr. Hart seems to meet the requirements as to color and strength.

TAKING THE IMPRESSION

The casting is next placed on the amalgam die and given a preliminary burnishing and polishing, and then it is fitted to the tooth and a modeling compound impression is taken sectionally, first taking an impression of the lingual, then chilling and removing it carefully in the tray, and then after this impression is trimmed the teeth are coated with sweet oil or Nujol, as Dr. Hart recommends, and then the impression is placed back in the mouth and a strip or roll of warm, softened modeling compound is placed over the labial surface of the teeth and the patient is instructed to press the lips tightly together just as though they were going through the movement of sucking hard. In this manner a perfect impression of the labial surfaces and interproximal spaces is obtained. The cast abutment is then placed in position in the impression and the sectional parts are waxed together. We make a model from this impression, using "Sump" or some other material which has the least amount of shrinkage. Next a full impression of the lower opposing teeth is made and a model run up from this in Alstone or Weinstein's

Artificial Stone, and both the lower and upper models are articulated on an anatomical articulator, so as to get the proper relation of the teeth, lateral movements, etc.

PREPARATION OF THE FACING AND MANUFACTURE OF THE ROOT

We now come to our next step in construction, the preparation of our facing and root attachment. Our instructor advised us to select a facing of the proper width mesiodistally so as to get good contact points, and also that our facing should match the same tooth on the opposite side in size and general outline. A platinum backing of thirty-six-gauge is fitted over the pins of the facing and turned back at right angles where the bevel ends on the pin side of the facing near the gingival. In this manner we have prepared a base on which the porcelain for the root is built.

The color of porcelain used is always of a much darker color than the gingival portion of the facing. S. S. White's shades R. & J. Porcelain are the colors commonly used in this work because they seem to give a more natural appearance to the root. The porcelain is mixed very stiff and then built up on the platinum base and gingival portion of the facing, then shaped with the fingers and left slightly oversize for the biscuit bake. This first bake is obtained by leaving the porcelain in the furnace with a gold pellet alongside. When the heat in the furnace melts this pellet the mica slide over the opening of the furnace is removed and the root is allowed to become absolutely cold before it is taken out of the furnace.

I referred to the use of the radiograph in the beginning of this paper, and it is in this next step that the radiograph is consulted, to give us a knowledge of the length and inclination of the tooth to be replaced.

Take next a very small, sharp instrument and cut away the impression of the tooth to be replaced, following the outline of the gingival margin and being very careful not to destroy this outline or the gum septum outline. Then drill down straight with a large, round bur which has been ground slightly to a point, following the direction of the root as shown in the radiograph, and the outline as shown on the labial surface of the cast. The required depth should run usually to about two-thirds the length of the root. The biscuit-baked root is then ground to fit the hole we have made. The incisal and approximal edges of the facing are beveled and the root is then ground down to the proper size, washed with some good cleanser, and dried and then returned to the furnace for the final bake. After the final bake is finished the porcelain root is returned to the model and waxed into position, using black, sticky wax, and then the labial surface of the model is coated with a separating fluid, and a core impression made of this surface, using soft plaster. This impression is used as a guide in getting the proper relation of the teeth and also as a sort of brace while we are waxing up the porcelain "dummy." Next wax up the dummy for the backing, and carve and then separate the wax and the "dummy" by inserting a sprue in the wax and touching the labial surface of the facing with sticky wax and gently drawing the wax pattern and porcelain apart. Before investing the wax pattern place carbon points in the holes made by the pins.

ASSEMBLING AND SOLDERING THE BRIDGE

Fit the casting to the "dummy" and polish and then replace in the model, using the plaster impression that we made of the labial surfaces, to get the proper alignment. Wax the abutment and casting for the "dummy" together with sticky wax and then cut away all that part of the model that covers the porcelain root on the labial, so that this root can be removed easily. Remove root and then scrape away all traces of the separating medium used. Soak the model in water and add more "Sump" to the labial surface. Let this dry and then boil out the sticky wax, after which we are ready to solder. Only a very little bit of solder, properly coated with flux, and a small needle flame on the blow-pipe, are needed to tack the abutment and backing of the "dummy" together.

The bridge is now ready to be set in the mouth. The patient returns, (with the tooth extracted at some previous sitting) and the bridge is fitted to place. If there is any further grinding of the root necessary this is done and the root glazed again. If nothing further is to be done the bridge is set.

THE CROWN AND BRIDGE*

DRS. OTTO FRUTH AND MALCOM ROBB, INSTRUCTORS

REPORT BY DR. J. F. ALCORN, CHAIRMAN, ST. LOUIS, MO.

SINCE THE TIME of the patenting of the process of restoring a broken-down tooth with an artificial crown and the substitution of a fixed bridge in place of teeth lost, crown and bridge work has made no change approaching the radical. As a clinical show it will always rank among the foremost in the special arts of dentistry, but as a theme for discussion, this subject creates no grandstand edition.

The Crown and Bridge Class of the St. Louis Study Club has, this afternoon, exhibited the finished product of the course of study devoted to that subject under the direction of Doctors Malcolm Robb and Otto Fruth. In this course nothing new has been attempted. The old principles only have been revised and a bridge is here constructed along modern lines.

The case was selected from the upper right side of the mouth extending from a three-quarter crown on the cuspid to a ferrule cast crown on the first molar. The first bicuspid substitute being a Trubyte Diatoric with cast gold saddle and the second a plain facing with cast gold occlusal and saddle.

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*Read before the St. Louis Study Club, January, 1920.

Beginning with the cuspid the preparation of the abutment should be as follows: With a safe-sided knife-edged disc cuts are made on the mesial and distal sides of the tooth beginning at the incisal and proceeding to the gingival margin. When preparing the mesial, the disc should assume a position slightly distal on the lingual side and in the distal cutting the disc should incline to the mesial on the lingual, thus while completely cutting away the bulge or proximal contour, the esthetic is insured by destroying a minimum of the labial plate. A slight shoulder is produced at or slightly inferior to the gingivæ. The lingual portion is prepared by using a small tube-shaped mounted stone and continuing the gingival shoulder from mesial to distal, bearing in mind that a deep shoulder is not necessary as it serves only the purpose of a definite finishing margin, one-half millimeter or less being sufficient. The concavity is then cut away to allow for the bulk of casting. This calls for very little if platinized gold is to be used in the casting. A small tapering fissure bur is then selected and beginning at a point fairly well back of the labial enamel plate mesially and distally, prepare retention grooves by proceeding toward the gingival, not on a line parallel with the long axis of the tooth, but in a labiogingival direction allowing groove to end at the extreme labial end of the gingival shoulder. Naturally, these grooves must diverge as they approach the gingival. The last step is the connecting of these retention grooves with a shallow slot across the lingual from mesial to distal and just back of the labial enamel plate. This is best accomplished with a small knife-edged disc. The incisal edge may or may not be beveled as the operator elects.

The direct method of waxing is employed. The wax is heated and brought into position by cocoa butter-oiled silk or thin celluloid strip and the patient allowed to bite, thus giving a fair shape and positive thickness to the model. The strip is removed when the wax has assumed a body temperature and finishing is then accomplished. The strip is again adjusted and constricting pressure gives a last drive to the wax compelling it to seek a clinging adaptation to margins and retention grooves.

Withdraw wax model and invest. For casting, use gold alloyed with platinum, for as a bridge attachment the three-quarter crown requires a maximum of strength and receives its retention from but three-fourths of the tooth as the name implies.

The first molar we will suppose is vital and is ground down to receive the gingival edge of the crown anywhere from one-half to two millimeters from the gingivæ according to the more or less bell shape of tooth and the degree of sensation involved. The walls are allowed to converge as little as possible, keeping in mind that these walls, especially the distal, must parallel the grooves in the cuspid. The occlusal is cut away to allow for bulk of material, keeping the general shape of the cusps, to avoid encroachment of the horns of the pulp as well as to give rigidity to the attachment when in place. A band is now fitted and a moon-shape is cut out of both buccally and labially leaving a band one and one-half millimeters wide on the buccal and labial and running to a point occlusally and in the interproximal spaces. The advantage here given is the ease of proximal contour and a finishing edge of soft, burnishable gold at the margins of the crown.

A bite and an impression are taken and models articulated. The tooth end within the band is given a slight coat of inlay investment which will give a slight space when casting is completed, between it and the occlusal surface of the tooth. This step is highly essential as the crown must not ride on the piers occlusal.

Wax and carve as the case dictates.

Before investing a slight groove is cut in the mesial occlusal angle to engage a fourteen-gauge lug which will be cast into the second bicuspid substitute or dummy, thus minimizing the amount of solder to be used in assembling and adding strength to the finished bridge.

Cast in a hot mold, using 22 K gold.

Both crowns are polished and adjusted to their place on the teeth and modeling compound bite and plaster impression are taken. The plaster impression receives the following treatment before investing: Over the edentulous ridge is pressed a small sheet of about twenty-eight-gauge wax, thus giving to the model a uniform relief of the ridge which must come in contact with the saddles. Models are now articulated.

A Trubyte Diatoric first bicuspid is selected which will lap the ridge two or three millimeters. The Trubyte is chosen for its anatomical form and superior strength. The lingual rubber finishing shoulder is ground parallel with the buccal surface or the lingual portion of the lingual cusp is cut to parallel. Grind away a portion of both mesial and distal surfaces just below the occlusal plane to allow for the attachment of a sixteen-gauge clasp wire to engage the teeth approximating. A boxing is then prepared by burnishing a backing of thirty-two or thirty-four-gauge pure gold. The boxing is allowed to lap the buccogingival or root portion about a half millimeter and extend to within one-half to one millimeter from the occlusal surface on mesial, distal and lingual surfaces. A cross cut is made with a knife over the rubber retention pit and flaps turned in. A small cone of inlay wax is gently pressed into pit and attached to the backing surface with a hot spatula. The backing is waxed up and while the wax is soft is forced to place on the ridge and to occlusion. Remove and trim. In trimming, remember that the saddle should cover a minimum of the ridge, therefore slightly exaggerate the interdental spaces and allow the lingual portion to converge well toward the gum. A soldering lug of sixteen-gauge clasp wire about one and one-half millimeters in length is embedded to half its depth in the wax on the mesial side and rested in depression cut in the cuspid three-quarter crown. The porcelain tooth is removed and the case invested and cast. Platinized gold is preferable in this casting especially if the mesial and distal walls of the box are thin. Any discrepancy in the casting occurring about the buccogingival lap will be best cared for by flowing twenty K plate or solder over that portion. Finish and polish before attempting the next tooth.

For the second bicuspid a long pin facing is selected. The edges are beveled and pure gold is burnished over the back. The tooth is waxed and forced to position on the model and to occlusion. After trimming to conform to the lines of the first bicuspid and carving to occlusion, adjust lugs on mesial and distal surfaces at the occlusal angle to engage slots cut in distal of first bicuspid and mesial of first molar. Draw out the facing and in the pin holes place graphite points, invest and cast using 22 K gold.

When the second bicuspid is polished the bridge is ready to assemble. The lugs and their engaging slots serve as a guide. The case is waxed with sticky wax at the joints to be soldered and the case is invested. The great advantage in the use of the lug is now manifested. It minimizes the amount of solder and aids in its flow, producing a joint far stronger than solder of many times its bulk.

The bridge is polished and diatoric tooth and facing are cemented to place. The case is completed.

Objection might be raised to the employment of the saddle but there are objections to be found in any form of bridge one might devise. The advantages in the subject bridge far outstep the objection. The saddle is a minimum as such, covering in close adaptation very little more soft tissue than the lap facing of the so-called self-cleansing span. The lingual of the substitute teeth conform in a measure to the shape of the natural, and are accepted far more kindly by the tongue than any other construction. From the standpoint of esthetics the bridge is all that could be desired where gold is the base. Both substitute teeth of diatoric construction would furnish the ideal.

From every angle of discussion, it is felt that the best possible form of replacement has been offered the class for this given case.

The class extends to you, Doctors Robb and Fruth, a deep measure of thanks for the time and trouble you have spent endeavoring to improve the technic of your professional fellows.

Metropolitan Building.

ROOT CANAL TECHNIC*

DR. W. A. CHAMBERLAIN, INSTRUCTOR

REPORT BY DR. J. P. MARSHALL, CHAIRMAN, ST. LOUIS, MO.

Now to my assignment. The topic of my little paper shall be called "Callahan, Collidge and Howe a la Chamberlain."

First of all, let me say that after properly sterilizing your root canals, you may fill them by any one of a number of approved methods, but the first essential in the proper filling of a root canal, is a canal not only temporarily sterilized but one so sterilized that the likelihood of reinfection through organic matter remaining in the tubuli and small multiple foramina is practically nil. Therefore, the big question is the preparation of the canal for the root filling.

The first step is proper access. If you do not cut the tooth freely on the end where it can be easily repaired, the little fellows will cut it joyously on the end where you can't restore it. With the field of operation properly isolated, and the tooth so opened that you have a clear and unobstructed view of the entire floor of the pulp chamber, make an effort to enter the canals with a smooth broach. In case this cannot be done freely, use sodium potassium, carrying it to the canals on a barbed broach but use a smooth broach for working it into the canals. Especial care should be exercised in the use of sodium potassium that all moisture be kept away, as it may be necessary to call out the fire department in case saliva finds its way to the cavity during the use of that agent. Follow the sodium potassium with an application of forty per cent. solution of H_2SO_4, first inserting a Rhein Pic or like instrument in the root canal and deposit your solution around the instrument. In this manner the acid can more easily be carried to all parts of the canal through capillary attraction without the danger resulting from the use of a pumping motion. The enlarging of the canal is accomplished with files of varying sizes, using a thrust to the right in inserting and the reverse movement in withdrawing, exercising care so as not to block the canals or force debris beyond the root end. When the canals have been sufficiently reamed, neutralize the acid with a saturate solution of bicarbonate of sodium. So far, so good, but what of the many canals which defy the most improved technic, of small multiple foramina that under the old technic have been impossible to properly sterilize or adequately fill and what of that bug-a-boo, the collateral canal?

Dr. Raper has found in working on dissociated molars that in sixty-six and two-thirds per cent. it is impossible to open the canals and properly fill them to the apex, and let it be remembered that this work was done in the laboratory without many of the handicaps that are attendant upon operations on the tooth in the mouth. A check of the results of the work of this class and supplementary work done by the chairman confirm these findings of Dr. Raper.

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*Read before the St. Louis Study Club, January, 1920.

Now, are we going to extract all of these teeth or is there some other method by which we can permanently sterilize and fix any organic material that may chance to remain in the root end, in the tubuli or in collateral canals that will warrant us in leaving that tooth in the mouth and assuring the patient that it is not going to be a menace to their health through re-infection and thus be the seat of some systemic disorder?

You are all no doubt, more or less familiar with the work Dr. Howe has done with ammoniated silver nitrate and with the accomplishments of our own Dr. Chamberlain along that line, but I am convinced that the wonderful possibilities of this method of root preparation are not as widely known or practiced as the results justify.

Now to briefly sketch the technic of ammoniated silver nitrate treatment. It is not necessary, but as yet seems a safer practice in putrescent teeth, at the first sitting to open the pulp chamber and seal in some medicament such as chlorazene. At the next sitting, proceed as indicated above in the preparation of your canals, open and cleanse thoroughly where possible (though Dr. Howe says even this is not necessary), plug up canals with cotton points and paint the cavity and tooth crown with Caulk's varnish, dry quickly with warm air, remove cotton points and you are ready for your silver solution—insert a smooth broach or canal point in the canal as this will serve to increase the capillarity and then deposit solution A. around broach or point moving same slightly in order to release any entrapped air, but *do not pump.* After three to five minutes remove the excess solution with cotton points and apply solution B. in like manner. This reduces solution A. and results in a flocculate deposit of free silver thoroughly impregnating and fixing any remaining organic material in crooked canals, collateral canals, small multiple foramina and in the tubuli of the rest, resulting in a permanently-fixed sterile condition of the root, and if proper technic is followed is an armour through which re-infection can not enter.

There are many phases of the use of this preparation which the time allotted prevents me more than mentioning, such as its use in abscesses, acute and chronic, in freshly-devitalized teeth and in the fixing of unremoved decalsified dentin in cavities over vital pulps; but if the little I have given you will but serve as an appetizer and stimulate you to a desire for a complete working knowledge of ammoniated silver nitrate, I will refer you to the contributions of Drs. Howe, Chamberlain and others in current dental literature on this subject or better still, get your name on the waiting list of the St. Louis Study Club for the Root-Canal Class and get the whole thing first hand from Dr. Chamberlain himself.

Metropolitan Building.

RADIODONTIA*

DR. C. O. SIMPSON, INSTRUCTOR

REPORT BY DR. MAX FENDLER, CHAIRMAN, ST. LOUIS, MO.

"DENTISTRY IS A PROCESS HOT IN THE MAKING"

The class in Radiodontia has been fortunate not only in absorbing a most complete symposium of the science of Dental Radiography, but in being quizzed individually, thus stamping indelibly the instructor's observations and meaning.

When Professor Roentgen in the year 1895, gave to the world his epoch-making discovery the "X-ray," he assisted in molding the present methods of progressive modern dentistry, and brought into vision a secret of the ages, man's hidden skeleton, by the aid of a shadograph.

By X-rays we mean a radiation proceeding out from the interior of a highly-exhausted bulb through which a discharge of electricity is taking place. This radiation differs in all respects from light and other known radiations. The essential feature is two metal conductors serving to introduce and to withdraw the electric current. The conductor which introduces the current is called the anode, and the conductor by which the current leaves the exhaust bulb is called the cathode.

A general routine radiodontic examination of the oral cavity should consist of from sixteen to twenty films. Too much information cannot possibly be obtained when we consider the conditions which might be exposed, such as unerupted and impacted teeth, periapical involvement, necrotic tissue, malignant or benign growths, radial perforation, canal operations, periodontoclasia and its many phases, fractures, sinusites, caries of the teeth, size and shape of roots before attempting crown and bridge operations. Obscure disturbances, such as roots, cysts and granulomas remaining long after tooth extraction.

We should never attempt an X-ray diagnosis without having: *first*, a knowledge of the tissues in the normal; *second*, a full history of the case, age of the patient, pain, etc., and *third*, a thorough clinic examination. Snap judgment is bad, a film should be studied from every angle as a boy studies a puzzle picture, turning and twisting, viewing with the aid of a large magnifying glass to assist microscopically. Think twice, then reserve your diagnostic opinion until you look again and again. "There is many a slip twixt the cup and the lip."

Anatomical limitations in dental radiography are many and loom big and troublesome in the field of interpretation, such as flat bone, the malar bone, crowded teeth, the antrum, upper second molar, palatal bone, anterior and posterior dental canals, septum of nose, small arch where teeth are superimposed, dense bone, lower first molar at apex of nerve, shadows of inferior dental canal and mental foramen, coronoid process, external and internal oblique line, etc. These many obstructions make diagnosis a most difficult one and should prove to us the importance of clinical observations.

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*Read before the St. Louis Study Club, January, 1920.

Gentlemen, the dental profession is alive and awake to the importance of oral sepsis. We are not unmindful of its great significance, and even now struggling with its import; struggling, yes, for we shall not go back the old way, the unsound must be met and eliminated. We may read in our dental periodicals words of dissension and contradiction, but these are after all, the processes of advancement, the signs and evidence of construction, the forging of the beams and the fitting of the timbers for a better structure. The difficulties so manifest are contributing to our welfare. In trouble we are being pounded into wisdom and understanding, in chaos we are reaching unity.

Truth shall surely prevail; how soon depends upon our own efforts. Let us join hands with our medical brothers and drive on and from this crisis, if I may so express myself, we shall emerge lifting our heads to a new light, brighter and finer than ever before.

CONDUCTIVE AND LOCAL ANESTHESIA*

DR. A. C. ENGEL, INSTRUCTOR

REPORT BY DR. W. L. O'NEILL, CHAIRMAN, ST. LOUIS, MO.

AS CHAIRMAN of this class, it has been my duty to prepare a paper covering the course of instruction we have received from our most capable and enthusiastic instructor, Dr. Engel.

This is a broad field to cover and if well done, would require a book. The subject was thoroughly covered during our course of instruction and study, but on this occasion I will not attempt to go into the anatomy, osteology, neurology, etc., because all this is to be found in books on anatomy and other textbooks, much more complete and in better form than I would be able to give it to you; and to master this part of the subject simply requires time and study, so I will direct my efforts toward the practical application of this knowledge and information gained by our instructor through several years of practice, and imparted to us.

We were first thoroughly drilled on the subject, then a night was devoted to a general quiz; another night to a practical demonstration by the instructor, by making the various injections, and operations being performed on the subjects; another evening we were given a written examination, and then an evening was devoted to actual injections being made by members of the class.

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*Read before the St. Louis Study Club, January, 1920.

To avoid omission and repetition as much as possible, I have arranged the important points to be considered under various headings and about in the order of consideration, leading up to the actual injections, and when we come to that part of the subject, only the structures and guides to be considered will be mentioned.

Essentials for Success—Know the osteology, neurology and topography of the parts involved and the necessary pharmacology, and observe to the minutest detail everything pertaining to the operation.

Contraindication—Not indicated where area of infection covers points of injections or areas to be injected. Where unfavorable psychological conditions cannot be overcome.

Indications—Is indicated in practically any operation where we (and incidentally the patient), desire the elimination of pain. In exodontia, especially impactions and the more difficult cases, surgery of hard and soft tissues, fractures and extirpation of pulps.

On vital teeth—preparation of teeth for fillings, inlays, three-quarter crowns, jacket crowns, gold shell crowns, full ferrule cast crowns, cementation of these various restorations, prophylactic operations, etc.

Failure to Anesthetize—Where no or insufficient anesthesia is obtained, due to faulty technic or lack of sufficient amount or strength of solution. In these cases a second injection can be made at the same sitting and this condition corrected.

Failure may be due to using a solution which has been contaminated by sodium bicarbonate. This could take place through using a sterilizer used for other instruments. The sodium bicarbonate will precipitate the procain, thereby destroying the anesthetic property of the solution.

The use of deteriorated solutions, due to other chemicals or bacteriological action, may also cause failure.

Or, failure may come from the use of too great a percentage of suprarenin in the solution, its astringent properties preventing its penetration to the center of thick nerve trunks.

Oedema—May be caused by:

First, using non-isotonic solutions, thereby exerting osmotic pressure.

Second, infection, either present at time of injection or carried there by non-sterile equipment or solution.

Third, injecting into muscular tissue.

Fourth, rupturing a blood vessel.

Fifth, traumatism.

Pain While Injecting—This may be caused by:

First, dull needles.

Second, presence of alcohol or other chemicals in solution.

Third, injecting a solution of a temperature varying greatly from body temperature.

Fourth, using a non-isotonic solution.

Fifth, injecting into an infected area.

Sixth, excessive pressure.

Seventh, injecting into muscular tissue.

After-pain—This may be caused by:

First, infection, either present at time of injecting, or carried there.

Second, traumatism.

Third, using a deteriorated solution, due to age of solution or tablet used.

Fourth, some preservative used in the solution.

Fifth, spiculæ of bone left in socket or by rough margin of the alveolar process.

Sixth, injecting into muscular tissue.

Undue Length of Period of Anesthesia—This may be due to the presence of alcohol in the solution, in which case anesthesia may continue for several hours or even months depending on the amount injected.

False Ankylosis—In the mandibular injection, if the needle is too low, or below the lingula, or contact with the ramus is lost, the internal pterygoid muscle will be infiltrated, which may cause false ankylosis, which may last from a few hours to several days.

It is possible for false ankylosis to occur in the zygomatic injection by infiltrating the buccinator muscle.

General Unfavorable Symptoms—May manifest themselves in the following manner:

First, pronounced pallor.

Second, cold perspiration on forehead.

Third, muscular pains.

Fourth, increased heart action.

Fifth, queer feeling in extremities.

Sixth, trembling of extremities.

Seventh, syncope.

Many of these unfavorable symptoms may be due entirely to psychological origin. To prevent this, positive assurance must be given the patient that no serious effects will result from this operation. You must gain their confidence and put them at ease. This may readily be accomplished by familiarizing the patient with symptoms to be expected.

Some of these symptoms may come from too rapid injection of the solution, which increases the toxicity of any anesthetic. More time should be given—a good rule to follow is to allow one minute to deposit 2 cc. of solution.

The principal cause of these conditions is the use of too great a percentage of suprarenin in the solution; it has been demonstrated this is the toxic element in the solution. In many cases, tablet-E will cause ill effects, where tablet-T will not; therefore, it would be good policy to use tablet-T in most cases.

Preventive Measure—It would be well to administer about twenty-five drops of aromatic spirits of ammonia in about two ounces of water a few minutes before making an injection.

Syncope—In this case, administer aromatic spirits of ammonia, strong black coffee or strychnin sulphate, and bend patient well forward until the head is between the knees, and apply slight pressure on the jugular vein, thereby retarding the flow of blood from the brain. If more convenient, the patient may be placed in a reclining position, having the head lower than the body.

Cooperation of Patient—In conductive anesthesia, the patient is in practically a normal condition and therefore able to clear the mouth, maintain a suitable position for the operation and in many ways aid the operator, all of which are pronounced advantages over general anesthesia.

Diminished Hemorrhage—In conductive and infiltration anesthesia, the hemorrhage is very slight, due principally to the presence of suprarenin in the solution. This is marked advantage over general anesthesia.

Duration of Anesthesia—Owing to the long duration of anesthesia, which varies from an hour to an hour and a half, ample time is given for most any operation. The accuracy of the injection will cause some variation. The principal cause for variation is due to the addition of suprarenin to the procain solution.

Suprarenin—The concentration of the suprarenin in the injecting solution must be varied in many cases, because the toxicity of suprarenin depends upon the strength of the solution in a given dose. The strength of the solution should be lowered, or the suprarenin eliminated entirely from the solution to be used on patients affected by arteriosclerosis, nephritis or cardiac disorders, as constriction of the neighboring blood vessels may cause cerebral hemorrhage.

The suprarenin, by its vaso-constriction, prevents the constitutional absorption of the injected solution, thereby still further diminishing its toxcity.

Varying the percentage of suprarenin used does not seem to cause much variation in the duration of anesthesia, but the greater the percentage used, the deeper the anemia of the parts involved.

Metz tablet-E contains the most suprarenin, or 0.00005 gram.

Metz tablet-T contains the least suprarenin, or 0.00002 gram.

Metz tablet-F contains no suprarenin.

This amount may be varied to suit any given case by using these tablets in various combinations.

Ringer Tablets—These tablets are used in conjunction with the procain suprarenin tablets to produce an isotonic solution. Each tablet contains:

Calcium chlorid, 0.004 gram; potassium chlorid, 0.002 gram; sodium chlorid, 0.05 gram.

Procain—Contrary to the action of cocain, it makes no difference whether a given dose is injected in a high or low percentage solution, as long as the full dose of 0.5 gram is not exceeded, which is perfectly safe, for as much as two grams have been administered subcutaneously without causing any damage. The best strength solution for dental purposes is two per cent.

Metz tablets-E and-T each contain the same amount of procain, which is 0.02 gram. Metz tablet-F contains the most procain, or 0.05 gram.

Procain Suprarenin Tablets—Only fresh tablets should be used. They deteriorate with age; this is shown at first by a slight pink color which darkens to almost red. Tablets showing *any* discoloration should not be used. Great care should be taken to prevent any moisture from coming in contact with these tablets, as this would materially hasten deterioration, therefore, the stopper should be replaced immediately after use.

Procain Suprarenin Solution—This solution should be as clear and colorless as pure distilled water and only fresh solutions should be used. *This solution is to be considered fresh only directly after the tablets have been dissolved.* The more dilute the solution, the less stable it is. In ten minutes the solution will show discoloration, from action of high temperature, light or air, diminishing its power and increasing its toxicity. No attempt should be made to make this solution antiseptic, as the yellow discoloration of the procain and the red discoloration of the suprarenin are due to oxidation and not to bacterial action.

Preparation of Procain-Suprarenin Solution—Select dissolving cup of proper size, from the Ringer flask pour in the amount of solution desired, hold over alcohol flame until solution boils, then place one procain suprarenin tablet-E or -T, in cup for each cc of solution. This should be done by slowly rolling the bottle from side to side until the tablets drop out one by one, without being touched. The hot solution will readily dissolve the tablets. Now place the cover on the cup to prevent contamination and the solution is ready for use. This solution should be injected at body temperature.

Metz tablet-F, containing no suprarenin, but containing more procain than E or T, is seldom used except in combination with the other tablets. This combination is to be figured for the special case in hand.

Isotonic Solution—It is very essential that our solution be isotonic, that is, a solution having the same salt constituents as the cell contents, then there will be no disturbance in the cell tissue; but if the solution be hypertonic, the water from the cell will escape into the injected solution and the cells will shrink. If the solution be hypotonic, the reverse will take place, that is, the water from the solution will be taken up by the cells and the cells will swell. In either case the cells will die, causing sloughing and pain.

Preparation of Isotonic Solution—More solution should be made up than is necessary for immediate requirements, as it will keep for some time. When it becomes the least cloudy, it should not be used.

Place five Ringer tablets in flask, pour fifty cc of the distilled water into the flask, which will fill it, place stopper in position, closing vent but leave off cap from spout. Now, place flask in sterilizer and boil for twenty minutes, then place cap in position and solution is ready for use.

Instrumentarium—Syringe. One-all glass Luer type, four cc capacity, long and slender barrel. Advantages of all glass are: Light weight, affording a more delicate sense of touch; no washers, all parts can be boiled.

Needles. One iridio-platinum twenty-five mm. long, twenty-six gauge, or as fine as can be had.

Two iridio-platinum forty-two mm. long, twenty-six gauge. Advantage of iridio-platinum: non-corrosive; can be sterilized in flame without injury; can be readily curved for different injections. They seldom break, except at the hub; for this reason we use a needle of greater length than necessary, so in case one is broken while injecting, we have this excess portion to facilitate its removal.

Dissolving Cups—Two Novol cups with covers, one three cc capacity, one ten cc capacity.

Advantage: Can boil solution in them over open flame to dissolve the tablets. They are opaque, and opaque covers are furnished with them, which prevents disintegration from light and contamination from dust, etc.

Ringer Flask—One Novol flask, fifty cc capacity.

Advantage: Solution can be boiled in flask to sterilize; it has a ground-glass cap, also a ground-glass stopper, having an air vent which can be closed or opened by a slight turn of stopper to permit pouring solution.

Tissue Cleansing Solution—One bottle of tincture aconite and tincture iodin, equal parts.

Applicators of Wood—Ends cotton wound, for applying cleansing solution.

Ringer Tablets—One bottle of Fisher Ringer tablets.

Procain Tablets—One bottle of Metz tablets-E, one bottle of Metz tablets-T, one bottle of Metz tablets-F.

Sterilizer—A special sterilizer or pan used for this purpose *only*, to prevent contaminating these instruments with any chemical which might be used when boiling other instruments.

Water for Solution—Use a sterile bottle, free of any substance, chemical or otherwise, to contain really distilled and uncontaminated water.

Water for Use in Sterilizer—Should be distilled, as other water may contain chemicals which may cling to instruments and have a deleterious effect on the anesthetic solution.

To Sterilize Equipment—Have cap, stopper and flask, needles, plunger and barrel, cups and covers all separated; pin up as many pieces as possible in a dental napkin, except needles, which should be placed in a napkin by themselves to protect the points. Place all in a sterilizer with cold water and boil twenty minutes. The napkins facilitate removal from sterilizer.

Symptoms of Anesthesia—The tissues near extremities of nerves injected, tingle and become numb and the anesthesia travels back from nerve ends along trunk to point of injection, but never back of that point. The parts involved feel as though they were swollen and at times may appear hot or cold.

To Prepare Surface for Injection—Wipe surface dry and free from mucus, then with applicator paint with equal parts tincture aconite and tincture iodin, continue to rub surface until it shrinks or shrivels. Do not let saliva, tongue or anything touch the surface after it has been prepared, before injection is made. Do not touch needle to teeth, lips or cheek or anything before injecting. After one injection has been made and you wish to make another at once on the same individual, *pass needle through alcohol flame until it is white hot,* then expel some solution from the needle which may have been deteriorated by the heat and proceed with the injection. Pierce the mucous membrane, then inject a few drops and proceed with the insertion of the needle.

Testing Tissues Involved—This should be done before any operation is attempted, by pressing some pointed instrument against similar tissue not involved until it pains and then pressing it against involved tissue, using same amount or more pressure. Or, a tooth may be tested for anesthesia by using electric current in the same manner as used in testing for vitality. If this is felt, more time should be given for penetration and after the maximum time has been allowed and still the parts are not anesthetized, the injection has not been properly made. Try to determine your mistake and repeat the injection and test.

Time for Penetration—The time required for thorough penetration of the anesthetic solution varies from five to twenty minutes. This variation may be due to the varying degree of exactness of the technic.

Handling Syringe—The syringe should be held the same as a pen. In this position, better control and a more delicate sense of touch is to be had, which is very essential in feeling the way during insertion of needle.

After penetrating the mucous membrane, which is done by a quick jab, only slight force is necessary to insert the needle, after which one will be better able to judge whether or not the needle is following the proper course and in determining the location of the needle point by crepitation. The bevel side of the end of the needle must always be turned toward the bone, for in this position the point can follow close to the periosteum with less chance of penetrating same.

Movement of Needle—During the time the solution is being deposited, the needle should be very gently and slowly moved backward and forward. This is to prevent depositing the solution into a vein, should we happen to penetrate one.

Curved Needles—One of the forty-two mm. needles is to be curved about ten to twelve degrees, with the bevel of the end to the inside of the curve. This needle is to be used in mandibular and zygomatic injections.

The other forty-two mm. needle is to be curved about ten or twelve degrees, with the bevel of the end to the outside of curve. This needle is to be used in infraorbital injections.

The twenty-five mm. needle is to be left straight and is used in mental, palatine and infiltration injections.

Care of Needles—After use, the point should be examined and if found the least dull, it should be sharpened on a fine hone, being careful not to produce a feather edge by over-honing. Wipe the needle clean and then clean lumen by drawing distilled water through it. Then put away so points are protected and the needles are always ready to be sterilized and used.

Loading Syringe—Place the proper needle on the syringe in such position as to enable you to read the scale on the barrel while depositing the solution; now draw into syringe the amount of solution required and then hold syringe point up and expel all the air from the syringe.

Mandibular Injection (right side)—Place the index finger of left hand to buccal of lower molars, push soft tissue outward, pass finger back and up to the external oblique line, pass finger over this line until ball of finger rests in the depression called the retromolar triangle, which lies posteriorly and externally to the last lower molar tooth. Now turn finger, radial side down, then palpate with the nail for internal oblique line. Now move the finger slightly outward, exposing the tissue over the internal oblique line; with the applicator, paint tissue over this line with the iodin solution. The syringe is held in the right hand, the barrel on a line with occlusal of lower molars. At a point above the center of the nail, or one cm. above occlusal of last molar, puncture the mucous membrane, striking the internal oblique line. Now retract the needle slightly to be sure to release it from the periosteum. Without changing position of syringe, move the needle point to lingual, but keeping in contact with the internal oblique line. Here deposit about one-fourth to one-half cc of the solution; this is to anesthetize the lingual nerve. Then swing the syringe barrel to about the cuspid region of opposite side; this angle of syringe varies with the variation of the degree of angle of the ramus from the median line. Insert the needle slowly, keeping contact with the periosteum on lingual of ascending ramus until the point of the needle strikes the posterior boundary of the sulcus mandibularis. Then withdraw the needle slightly so the point will be within the sulcus. Here deposit about two and one-half cc of the solution to anesthetize the inferior dental nerve. Withdraw the needle and pass the needle through alcohol flame until white hot from near the hub out to the point, hold the syringe point up and expel some solution to eliminate any solution the heat has caused to deteriorate. Now hold cheek so as to expose the inner surface and treat with the iodin solution and puncture the mucous membrane at a point above the occlusal of molars and opposite a point between the first and second molars. Here deposit about one-half cc to anesthetize the buccal nerve of the buccinator muscle.

To make the left mandibular injection, the operation may be just reversed; that is, use the left hand to perform that which was accomplished by the right, or the left arm may be placed around the head and the left hand used to determine point of injection the same as on right side.

The buccal and lingual nerves are injected only in surgical cases.

In the mandibular injection, needle insertion will be close to an inch, or about two-thirds the length of the needle. This varies greatly in different individuals and should not be the guide, but one must be guided by the feel of the needle point when it comes in contact with the posterior border of the sulcus mandibularis.

The mandibular injection should anesthetize all teeth on the side injected, to about the lateral; this tooth and the central of this side may be supplied by anastomosing filaments from the opposite nerve.

A mental injection on the opposite side will anesthetize all the anterior teeth, or if only the incisor need be anesthetized, this can readily be accomplished by infiltration on labial and lingual of incisors.

A mandibular injection on each side will anesthetize all the teeth in the mandible.

In the mandibular injection no resistance should be felt in depositing the solution in the sulcus mandibularis. If resistance is felt, this would be an indication of the injection being made under the periosteum or into the internal pterygoid muscle. In this case the needle should be removed and another attempt made.

Mental Injection—With the left index finger palpate the mental foramen, which is located below and between the apices of the first and second bicuspid. You may locate it as a tender spot and a slight depression. Retract lip with the thumb, paint surface, puncture mucous membrane in the fold between the first and second bicuspid and insert needle downward and slightly backward, depositing a little solution as the needle is advanced. When the solution is felt beneath the palpating finger, deposit here about one and one-half cc, using intermittent pressure by palpating finger to pump solution into mental foramen.

The mental injection may anesthetize the bicuspids, cuspid and lateral of side injected.

The same condition of nerve supply to the central and lateral holds good here as in mandibular injections, the anastomosing filaments of opposite nerve must be anesthetized by either a mental or mandibular injection of opposite side, or by infiltration.

Zygomatic Injection—Open mouth half way, swing mandible to side to be injected, retract cheek with thumb, paint surface, hold syringe at forty-five degrees to occlusal of upper molars and parallel with the cheek, puncture mucous membrane in the reflexion at apex of mesial root of second molar, deposit a few drops and insert needle slowly, depositing a little solution as needle advances, swinging syringe out from cheek to allow the needle point to follow close to the periosteum. After the mucous membrane has been punctured, no resistance will be felt until the point strikes the buccinator muscle. Penetrate this muscle and insert needle two-thirds of its length and here deposit about two cc of the solution in the sphenomaxillary fossa.

Where the second and third molars have not yet erupted, the next to the last tooth is used as a guide.

This injection anesthetizes the molar teeth, which are supplied by the posterior superior dental nerve. In case the mesial buccal surface of the first molar is not completely anesthetized, a small amount of the anesthetic may be injected between the first molar and second bicuspid opposite the apices.

For surgical operations on the molars, it is necessary to inject the anterior palatine nerves where they emerge from the posterior palatine foramen.

Insert needle about one-half inch from the gingival margin of lingual side of distal of second molar and insert needle backward toward the posterior palatine foramen. Do not penetrate to the foramen, but just anterior to it deposit one-third cc. This may anesthetize lingual tissue to the cuspid.

If needle is passed too far back, you may anesthetize the middle and posterior palatine nerves, which supply the soft palate and uvula. In this case, the patient will experience a gagging sensation.

If the second molar has not erupted, use first molar as a guide.

Infraorbital Injection—Draw an imaginary line passing from apex of second bicuspid to the pupil of the eye. On this line about one-half cm. below the infraorbital ridge, palpate for infraorbital foramen with the left index finger. With the thumb retract the lip, paint surface, puncture mucous membrane in the fold above the apex of second bicuspid as high as possible. Now advance needle along this imaginary line toward the infraorbital foramen, depositing a little solution as the needle advances. Be careful to keep the point free from the periosteum. When the needle and solution are felt beneath the finger, *very slowly* deposit about one and one-half cc, constantly massaging, using intermittent pressure from below upward with palpating finger over foramen to force the solution into the infraorbital canal, as the anterior superior alveolar nerve is given off just before the infraorbital nerve emerges from the infraorbital foramen.

The central, lateral and cuspid of the side injected are anesthetized.

In surgical cases it will be necessary to inject the nasopalatine nerve, which emerges from the anterior palatine foramen.

The anterior palatine injection is made by inserting the needle to one side of the papillæ, which lies between the upper centrals and advancing it upward and backward to the anterior palatine foramen. Here deposit one-third cc of the solution.

Upper Bicuspid Blocking—The zygomatic injection sometimes anesthetizes the second bicuspid.

The infraorbital injection sometimes anesthetizes the first bicuspid.

The nerve supply of these teeth varies greatly in different individuals, but most frequently it is from the middle superior dental branch, which is given off somewhere in the infraorbital canal, usually too deep to be reached by infraorbital injection. Therefore, the better method of anesthetizing the upper bicuspid teeth is by infiltration.

This can be accomplished by puncturing the mucous membrane over the second bicuspid root at a point half way between the gingival margin and the apex. Deposit about three minims and wait about one minute, then advance the needle to distal of apex of the second bicuspid and here deposit about one cc of the solution. Then on lingual, insert needle to distal of second bicuspid a short distance from gingival margin and here deposit one-third cc.

Infiltration Anesthesia—In this method, the peripheral filaments of the nerves are anesthetized by injecting the anesthetic either beneath the mucous membrane or beneath the periosteum. The subperiosteal injection requires much more pressure; for this reason it is preferable to use the submucous injection, as there will be less chance for traumatism. Almost any tooth in the upper arch may be anesthetized by this method, but the first molars and the cuspids are not so favorable.

A puncture is made on the buccal or labial surfaces about the middle of the root and a few drops deposited, then the needle advanced toward the apex of the tooth, depositing constantly until the apex is reached, and here about one cc of solution is deposited. Then the same operation is carried out on the lingual of the same tooth, only much less solution is required, which is about one-fourth cc.

When more than one tooth is to be anesthetized in this manner, the puncture is made over the apex of one tooth, and the solution deposited over this tooth. Then the needle is advanced beneath the tissues to the apex of the next tooth and so on, so far as the needle will reach in one direction. The needle is almost withdrawn, then pointed in the opposite direction and the teeth in this direction are handled in the same manner.

On the palatine surface, the various nerves are blocked as described under conductive anesthesia.

Infiltration Anesthesia of Lower Teeth—Only the four anterior teeth of the mandible may be *readily* anesthetized by the infiltration method.

To anesthetize all four anterior teeth at one time, puncture the mucous membrane on labial side at median line on a level with the apex. Deposit solution as the needle advances to one side along the apex level, until the incisive fossa is reached; here deposit about one cc of the solution and then withdraw the needle until the point is almost out; then turn the syringe in the opposite direction and proceed as before.

Lingually about one-fourth cc is injected just distally to the cuspid on each side.

Page and Academy.

DISEASES OF THE MOUTH*

DR. VIRGIL LOEB, INSTRUCTOR

REPORT BY DR. WM. B. SPOTTS, CHAIRMAN, ST. LOUIS, MO.

It is impossible, except in a general way, to give a report of the work considered in this class. All of the diseases common to the oral cavity were discussed, and to go into detail would consume more time than is allowed me.

We were first told of the great importance of making a complete examination of the oral cavity in every case which presents itself in our office. This is followed by the taking of a complete history which is kept as a permanent record. Such history contains the patient's name, address, sex, age, occupation and civil condition; also in as concise a form as possible, statements of the patient relative to the cause and symptoms of the trouble.

The various diseases of the mouth were grouped, and each group was considered in a general way before taking up the particular disease in the group. We first considered the various forms of stomatitis, discussing in detail the acute catarrhal aphthous, ulcerative and gangrenous types. Causes of those were discussed and the treatment described.

Since many of the drug poisonings show oral manifestations, the more common types such as mercury, bismuth, arsenic, phosphorus and lead were considered. Under specific infections the following diseases were discussed; syphilis, Vincent's angina, thrush, actinomycosis, tuberculosis, diphtheria, measles and scarletina. We were instructed as to the signs of these diseases which may be found in the mouth, and went into detail as to the causes, symptoms and treatment of the more common ones.

Other infections producing celluitis, abscesses, necrosis were next considered. Various methods of treatment were brought out and discussed, and particular stress was laid on the methods to be employed in order to avoid infection after extractions and other oral operations. Considerable time was spent on empyema and the maxillary sinus. Because of the close relationship between the sinus and the roots of the upper molar teeth infections of the former often followed treatment or removal of these teeth.

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*Read before the St. Louis Study Club, January, 1920.

Focal infections, pyorrhea alveolaris and oral prophylaxis were considered according to the following outline:

First, Focal Infection—a, causes; b, symptoms; c, pathology; d, diagnosis; e, treatment.

Second, Pyorrhea Alveolaris—a, causes; b, symptoms; c, pathology; d, diagnosis; e, treatment.

Third, Oral Prophylaxis—a, its necessity and benefits; b, detailed procedure, instrumentation etc.

Considerable time was spent on the relationship between focal infection and systemic diseases.

Throughout the course it was the purpose of our instructor to point out the necessity of making careful and frequent examinations of the oral cavity in order to ascertain the presence of any sign which might point to some diseases foreign to the one under consideration. He was particularly desirous that we should always feel that a benign condition under constant irritation might become very serious, and therefore advocated this frequent and careful examination in order to determine the presence of unsuspected lesions.

University Club Building.

BACTERIOLOGY*

DR. HARRY BLOCK, INSTRUCTOR

REPORT BY DR. L. R. MAIN, CHAIRMAN, ST. LOUIS, MO.

In submitting to you a report of the work done in the study classes in "Bacteriology and Its Practical Application in the Office of the Every-Day Busy Dentist," I can scarcely do more than mention, in the time allowed, some of the interesting and instructive ways in which the knowledge thus gained will aid us in meeting the problems of daily practice more intelligently.

A better understanding of mouth infection is the point of mutual interest of the medical and dental professions.

A laboratory course, such as was presented to our study class, is of inestimable value. It contributes to a more thorough understanding and comprehension of primary oral lesions manifested by symptoms in remote parts. For example, in the case of a patient suffering from rheumatism and presenting also an oral infection, a microscopic study of a culture of pathogenic organisms may identify some organism or chain of organisms responsible for this arthritic disturbance.

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*Read before the St. Louis Study Club, January, 1920.

When a growth of streptococci is obtained from a tooth or socket, we are in a position to suggest to the physician in positive terms the great necessity of ridding the mouth of these virulent organisms, because of their association with such systemic disturbances.

Since even in the mouths of apparently healthy individuals the various oral bacteria are ever present, I do not wish you to infer that wherever we find micro-organisms we necessarily find disease. However, where we find symptoms of disease we can often substantiate our suspicion by making cultures or by merely examining microscopically smears obtained from the mouth.

In doubtful root canals, that is canals in which the sterility is not certain, it is possible to aseptically remove some of the dentin along the walls or near the apex of the canal, make a culture, incubate, and endeavor to obtain a growth therefrom. If a growth is obtained it is certain that the canal is not thoroughly sterilized.

This sort of work also gives the dentist an opportunity to do some interesting experimenting along research lines in the treatment of dental lesions.

One might ask to what degree is such information of value to the dentist aside from broadening his mental horizon and enabling him to more intelligently consult with the medical man. To my mind it will give to the dentist who is mentally alert, an opportunity to treat dental lesions more scientifically. He can thus ascertain with what organism he is dealing and practice rational instead of empirical therapeutics, because of his knowledge of certain organisms and conditions that are favorable or unfavorable to their development.

By closely watching the results of certain drugs in a given case where the organisms are known, and by comparing these results in similar cases, we are in a better position (with the use of the microscope) to make an intelligent prognosis to the patient.

To my mind such a course will prove beneficial to every practicing dentist who is not already familiar with this work.

Metropolitan Building.

FULL DENTURES*

DR. E. B. OWEN, INSTRUCTOR

REPORT BY B. O. HAUN, D.D.S., CHAIRMAN, ST. LOUIS, MO.

THE MOST NEGLECTED PHASE of dentistry from a scientific standpoint is without doubt the prosthetic. Can we wonder at the laity coming into our offices every day and telling us how they dread the day when they will be obliged to wear a plate; Mr. Jones who wears false teeth whistles when he talks; Mrs. Brown's teeth make a clicking noise; Mrs. Smith has to take her teeth out when she eats; Mrs. Black's teeth look horrid, but she can eat everything. These and many other unfavorable comments we hear every day. For how much of this condition are the dentists responsible? Let us be generous with ourselves and say *nine-tenths*. We cannot hope to make the teeth as nature intends them to be, but we can and will improve on the exhibition of prosthetic art and science that the public is trying to endure at the present time.

As chairman of the Full Denture Study Club, I wish to extend to Dr. Owen in behalf of the class our gratification for a most simple, efficient, scientific technic for the construction of a full denture. I shall attempt to give you in detail our instructions as given us by Dr. Owen.

CLASSIFICATION

The procedure in examination should be first to determine in which class each individual case will come; for convenience, edentulous mouths are divided into four classes, namely: Class one, (uppers)—Firm ridges, covered with a uniform layer of slightly-yielding membrane. Buccal and labial attachments connected high on border of ridge. Class two—Firm ridges and vault, covered with tensely-drawn membrane, very small area of soft tissue over rear third of hard palate on either side of median line. Buccal and labial attachments connected close to crest of ridge and very definite in movement. Class three—Firm ridges, soft area in vault, particularly over rear third of hard palate on either side of median line. The buccal and labial attachments are connected to the ridge. Areas of movable soft tissue overlying the buccal and labial surfaces. Class four—High or low vault, soft ridges on tuberosities, and labial portion. Buccal and labial attachments either high or low vault, either hard or varying in density

Lowers: Class one—The prominent ridge that is hard all over. Class two—The flat, hard ridge with prominent muscles, whose bases of attachment are at least one-quarter inch from the crest of ridge in the molar region. Class three—The flat or high ridge where the muscular attachments are movable to the crest of the ridge, particularly in the molar region, (tissues soft). Class four—The flexible, soft ridge. Muscular attachments, either direct or indirect through soft tissue.

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*Read before the St. Louis Study Club, January 10, 1920.

Determining in which class your case comes will aid in paying particular attention to unfavorable conditions which might interfere with adaptation, adhesion, retention and comfort to patient.

Saliva—A very important factor to note is saliva conditions. A thick, ropy saliva is a very unfavorable condition for retention, and the fact should be mentioned to your patient at this time, as an unfavorable condition is easier explained than an unsatisfactory result.

So much for general conditions. Now on a chart draw outline of hard area in vault and mark area of soft tissue on either side of hard ridge. Mark margin of posterior hard palate which can be determined by having patient say, "Ah!" and note margin of flexibility. Pay particular attention to buccal cavities as to what extent they can be used to aid retention.

Lowers—Note muscular attachments on either side of ridge, flexible, soft or hard ridge, both anterior and posterior; how much area can be covered without discomfort to patient or interference with retention, as the greater the area with proper adaptation the more adhesion or suction.

The Upper Impression—Select a tray large enough to extend beyond the buccal and labial margins, and to the margin of the soft palate. The fit of tray is not important as we will construct a tray of compound. Heat Kerr's Modelling Compound in water to about one hundred and sixty degrees, place sufficient amount in tray in order that impression will extend slightly beyond the margins of your peripheral outlines; shape compound in tray high on palate and buccal and labial surfaces; insert in mouth and press to place. Allow short time for hardening; remove, and a rough impression in modelling compound will be the result. Cut away excess compound and remove from tray. Remove all evident excess in preparation for muscle trimming; cut labial peripheral margins to their edge for convenience; divide peripheral margins into four sections, beginning on buccal side; heat one section of peripheral margin over alcohol flame to a temperature where compound will almost run; temper in water heated to one hundred and sixty degrees and place in mouth; seat firmly with mouth partially closed and muscles at rest (when all massaging is done), and massage cheek and muscles with a downward and forward movement of the fingers. Reduce until there is no displacement of the muscles or soft tissue. Proceed in the same manner with each section, warming peripheral of compound and replacing impression in mouth, massaging muscles over area of compound which has been softened until a peripheral buccal and labial margin has been established, showing outline of all muscle attachment.

Post Damming—Heat a pencil of Kerr's Modelling Compound with dry heat almost to temperature where it will run, and apply over area on impression corresponding to soft tissue on either side of hard ridge on posterior margin. Place impression in mouth and seat firmly to place; remove and trim away excess on posterior margin; complete compound impression, showing peripheral outline, and post damming will be the result. Now, make a moderately-thin mixture of plaster; be sure to cover all surfaces of compound that should be outlined in impression; seat to place with a slight rotary movement—massage gently, allow to harden then remove. An accurate adaptation, with soft tissues slightly compressed, is the result. If removal of impression is difficult, place index finger on palatal surface and press with thumb on tissue in region of first bicuspid.

The technic for lower impression is carried out in the same manner, being sure to have compound impression cover all areas that can be utilized for retention without discomfort; remove impression from tray; trim periphery; heat in sections in same manner as upper; seat firmly in place; reduce peripheral by massage with fingers until buccal and labial peripheral margins are correct and there is no displacement of soft tissue. In getting impression of muscle attachments on lingual, heat sections of peripheral margin, using care not to heat buccal; seat firmly in mouth; have patient extend tongue beyond lips about one-half inch, in order to elevate muscles of floor of mouth; extend impression disto-lingually as far as case will permit without discomfort. When impression of lingual muscle attachments are complete and impression seats firmly to place without discomfort, proceed with plaster impression. Make moderately-thin mixture of plaster, fill compound tray, place in mouth, carefully moving it slowly and gently from side to side, allowing tray to almost seat itself or, in a manner, float to place. Have patient distend tongue, hold firmly, massage slightly over buccal end labial peripheral outline, allow plaster to harden and remove. Seat the impressions in a plaster base for convenience in handling and jarring the Spence box with plasticene to about one-eighth of an inch of peripheral margin. This will allow for the extension of the Spence model. Box with wax the height the model is to extend. Treat impression with Brophy's separatine, to which has been added one part of sandarac to ten parts separatine. Mix Spence's Plaster to the consistency of putty, pack small amount at a time into impression with fingers until surface is covered, jar and pack until level with wax, jar again until no more bubbles appear on surface. Allow at least two hours for hardening.

Adaptation of Graff's Base Plate—Heat base plate over flame until it is pliable. Adapt palatal surface; hold firmly in place and by use of chip blower direct flame on surfaces to be adapted, section by section, until lingual and buccal surfaces are completed. Remove, warm edges and trim until trial plate corresponds to dimensions desired in the finished plate; replace on model and heat as before with chip blower, until trial plate is thoroughly adapted to model.

Lower procedure is the same.

ESTABLISHING BITE-RIMS

With sheet of base-plate wax, made into roll, placed on ridge of each model following outline of rim pressed on a flat surface, establishing about the relation the bite is supposed to be. Have labial bite-rim arranged in symmetrical, graceful curve, and from cuspid posteriorly at almost right angle avoiding horse-shoe shape, dividing the space about equally on each model. Place in mouth and establish bite plane, trimming from each bite-rim, having patient relax, and by holding chin with hand moving the jaw downward and upward; note features and profile. When relations are established to within about an eighth of an inch of proper occlusion, remove, cool upper bite-rim, place in mouth, warm bite-plane wax on lower, and after getting jaws in proper relation, have patient close slowly, pressing upper wax rim into lower, watching profile and features until lips meet; then another slight pressure. Mark high and low lip and median line. Best results in majority of cases will be gotten by making upper anterior same length as upper lip. The frenum labia does not always represent middle line.

Checking Bite—Add soft wax on heels of lower and have patient close until bite-rims are in proper contact. Press wax with fingers on sides; remove and place rims together, reestablishing same relation as they were in mouth.

MOUNTING ON GYSI SIMPLEX

For convenience of lining up occlusal plane, a rubber band placed in notch of guide bar and in notches of uprights of distal posts, will form a correct line for occlusal plane. Talcum rubbed on flat surface of models will make them easily removed. Place soft wax under lower and seat until bite plane is in line with rubber band and forward to within one-half inch from guide bar. See that case is straight on articulator; attach upper with plaster; turn articulator upside down and attach lower.

SETTING UP TEETH

Cut away wax in upper bite-rim on left side parallel with median line; if necessary scrape away base-plate under the tooth, or grind the ridge-lap so that tooth will not rest directly against the cast. The long axis of the upper central should be vertical as seen from the front, and inclined downward and forward when seen from the side. The incisal plane is in contact with the occlusal plane of lower bite-rim. The upper centrals are not set at right angles to the median line, but the distal angles are inclined slightly backward and begin the curvature of the tooth-row to follow the contour of the bite-rim. Cut a space through the bite-rim for the upper lateral, set it so that the incisal edge is about three-fourths mil. above the level of the occlusal plane, and so that the long axis is inclined downward and forward. This inclination of the vertical axis results in depressing the cervical to a greater degree than the central or cuspid. The incisal edges of the laterals are set to maintain the curvature established by the edges of the bite-rim. Cut a space for cuspid, set so that its tip just touches the occlusal plane, slightly inclined distally at neck, and vertical with long axis. Set central, lateral and cuspid to correspond on right side. Cut space on left for upper first bicuspid—set so that buccal cusp rests on lower bite-rim, lingual cusp raised about one-half mil. above rim; long axis should be vertical. This position will in a way hide first bicuspid behind cuspid. This may be slightly modified in establishing articulation. The second bicuspid should be set like the first except both cuspids rest on lower bite-rim. Cut space for first molar and set so the long axis when seen from the buccal is inclined downward and backward; only the mesio-lingual cusp should touch the lower bite-rim, the distal lingual cusp being slightly raised, and the buccal cusp being raised about three-fourths mil. from lower bite-rim. Place second molar in position with lingual cusp touching occlusal plane and buccal cusp raised about one-half mil.; the long axis when seen from buccal is inclined downward and backward. Contour of bite-rim should be followed in arranging teeth. Proceed in the same manner with posteriors on other side.

Lowers—Beginning with first bicuspid, cut space in wax and set teeth in occlusion, using care that the middle line of posterior teeth is slightly lingual to middle line of ridge. Proceed in same manner on other side. In arranging lower anteriors, set cuspid so that the long axis is inclined upward and inward, with a slight mesial inclination when seen from the front. This will result in making neck of tooth more prominent. The lateral should be set straight. The central inclination should be slanting upward and outward.

Relief on hard palate is made just before closing flask, using four thicknesses of No. 60 tinfoil. Cover area of hard ridge burnished flat with cotton and cover with foil.

WAX, INVEST, VULCANIZE AND POLISH

Rechecking of Bite of Finished Case—Place uppers in mouth, set firmly to place, warm strip of base-plate wax and attach over occlusal surfaces of lower teeth. Place in mouth, have patient close slowly, biting about one-half way through wax. Remove without disturbing wax, place uppers in same position as they were in the mouth as impressions in wax will indicate. With wet cotton fill in undercuts of plates and pour plaster models. Mount on articulator.

BALANCE GRINDING

With articulating paper mark high places on teeth with end-to-end occlusion; grind with stone, mark again and grind until all high places from this force of contact have been removed, using care at all times to maintain original inclinations of cusps. Proceed in same manner, moving upper bow of articulator forward and backward; grind high places marked from this movement; then proceed same with lateral movement, first to one side and mark and grind, then mark and grind other side until rough high places are all removed. Now with emery dust mixed with glycerin and spread over occlusal surfaces, seat articulator firmly on bench and move upper bow forward and backward, using enough pressure so the emery dust will grind contact surfaces. Then with lateral movement grind one side, then the other, until a smooth, grinding, interlocking articulation will result.

Wall Building.

OFF FOR THE SUNSHINE MOUNTAINS

An American Red Cross dental ambulance about to start on a tour of the mountain district of Lower Montenegro. The natives call those mountains the "Sunshine" mountains, because their face is mostly white shale, which reflects the sun in blinding fashion. Most foreigners find it essential to wear blue glasses when traveling in this section. Captain Bruce Wolff, of Boston, Miss Olivia Hamilton, of Philadelphia, and Lieutenant E. Ralph Adams, of Lake Forest, Mich., have done splendid work in teaching dental hygiene and bringing dental relief to isolated committees in every part of Montenegro.

CORRESPONDENCE

MUSKINGUM VALLEY DENTAL SOCIETY ORGANIZED

BY EDWARD C. MILLS, COLUMBUS, OHIO

The Muskingum-Coshocton-Guernsey Counties Dental Society held their spring meeting at Cambridge, May 13, in the Masonic Temple. The afternoon session was held in the auditorium of the High School building.

Mr. Geo. E. Harter, of Toledo, business manager of THE DENTAL SUMMARY, gave a scientific and practical lecture on "Diet". A large audience, composed of the Senior and Junior classes, the laity and dentists, showed the greatest interest in the message he brought and the masterful manner in which he presented the subject.

The morning session was devoted to the business of the Society, followed by a re-organization, through which it increased its jurisdiction by adding Washington, Morgan and Noble Counties, and being christened "The Muskingum Valley Dental Society," as a component of the State Dental Society. Dr. H. M. Semans, president-elect of the Ohio State Society, F. R. Chapman, secretary, and E. C. Mills, ex-president of the same, all of Columbus, assisted in the re-organization. The officers of the Muskingum-Coshocton-Guernsey Counties Society were on motion continued, the personnel being as follows: P. F. Walker, Coshocton, president; A. W. Boyd, Cambridge, and P. E. Axline, Zanesville, vice-presidents; J. A. Honabarger, Warsaw, secretary; H. J. Boyd, Cambridge, treasurer; D. L. Rankin, Cambridge, to board of directors Ohio State Society.

The new organization is the crown sheaf of several organizations that have existed in the Muskingum Valley. The cover pages of the Dental Register during 1870 carried notices of the Muskingum Valley Dental Association, meeting monthly at Zanesville, mentioning William Herriott, president, and W. W. Chafelear, secretary, both of Zanesville. No known records of this society exists, but Dr. Herriott was an active member of the Ohio State Society in the early years of its history, and founder of the Mrs. W. M. Herriott and Sons dental supply house at Indianapolis.

The Muskingum County Society was organized at Zanesville, September 23, 1911, met monthly and did much locally for dentistry. On June 26, 1913, it was re-organized as a component into the Muskingum-Coshocton-Guernsey Counties Society, Dr. J. F. Knowlton, of Zanesville, serving as the first president.

The Southeastern Ohio Society was organized at Marietta, October 29, 1913, including in its jurisdiction Washington, Noble, Morgan and Monroe counties. Dr. T. S. Ward, of Marietta, always a staunch supporter of the State Society, was its first president. Owing to poor transportation facilities in getting the members together, his efficiency and enthusiasm was seriously handicapped. Dr. H. B. Hune, of Caldwell, succeeded to the presidency and continued in office until June 21, 1917, when Dr. J. Nicholas Smith, of Marietta, now of Columbus, was chosen president. At this, the last meeting of the Society, was organized the Southeastern Ohio Unit of the Preparedness League of American Dentists, through which the members of the society did meritorious service for the recruits from their section.

At a meeting of the *ad interim* committee of the State Society at Chillicothe, February 28, a dissolution of the society was recommended, three counties to go into the jurisdiction of this newly-organized society and Monroe County to be added to the jurisdiction of the Eastern Ohio Society.

RESOLUTION.

WHEREAS, Almighty God, in His infinite wisdom, has removed Dr. Frank L. Carey, an honored member of our profession, from this earthly life, and

WHEREAS, the late Frank L. Carey was a member of our organization and a brother with whom it was a pleasure to fraternize, both socially and professionally, and by his companionable personality and deep sense of honor endeared himself to all members of this organization to whom he was either personally or professionally known, therefore, be it

RESOLVED, that the members, of this, the Muskingum-Coshocton-Guernsey Counties Dental Society, feel that they have suffered a personal loss in his death, and that the Society as a whole extend to his bereaved widow, brother and sister, its sincere and heartfelt sympathy in their deep grief.

RESOLVED, that a copy of these resolutions be spread upon the minutes of this Society, and also copies be sent to his widow, sister and brother, Dr. B. T. Carey, also a member of this Society, and a copy be sent to THE DENTAL SUMMARY.

COMMITTEE.

EDITORIAL

THE PRESIDENT'S ADDRESS

Instead of being one of the strongest presentations at our society meetings, the president's address is often the weakest. In many instances it mainly is comprised of complimentary remarks to committees and a few suggestions for the welfare of the meetings. Any member could do this. If the other papers presented at our sessions were no more instructive than the average president's address, I venture the assertion that few members would care to attend, or deem it worth the while. A number of years ago Dr. M. H. Fletcher, of Cincinnati, before delivering his president's address at a meeting of the Ohio State Dental society, said that he believed a president's address should be a scientific presentation, and he proceeded to give one. It was the most meritorious paper presented at that meeting and had an influence on the society, for the presidents of several succeeding meetings prepared addresses on subjects worth while and the members of the society profited thereby. That suggestion of Dr. Fletcher's was noteworthy and we regret that it could not have been carried out by all societies. But it is not now too late. The man who is honored with the presidency of the National or State society, should make his annual address worth while. Men who are called to the head of a National or State organization ought to be men capable of giving the members something more substantial than a few suggestions and compliments. The members have a right to expect a meritorious address from the president of their society, whether it be on some subject of original research, investigation, application of some method or means in practice, or other matters that members will be interested in and can profit by.

In saying this we do not mean to reflect on the ability of the men who have been presidents of our organizations, nor to criticise what has been done, for presidents have followed the custom of our forefathers and given advice and made suggestions for the good of the society, and in doing this have felt that their duty has been performed. They have done their part as they have seen it, but in the face of the great advancement the profession has made and is making, and the problems it has yet to solve, is the president doing what reasonably may be expected of him in merely making in his annual address, a few suggestions on the conduct of the society?

The election of a man to the presidency of a State society means something more than an honorary position; it carries with it a responsibility and a duty. The president is recognized as the man at the head of the dental profession in his State. He assumes a leadership and it becomes his duty to set an example by act or deed, and in his annual address give the members something more than a few words of advice. He should prepare for them something that is elevating; something that is instructive; something every member will think about and be benefited by, for in so doing he exemplifies his position as a leader of the profession in his jurisdiction.

THE NATIONAL ANESTHESIA RESEARCH SOCIETY

At a meeting of the Board of Governors of the National Anesthesia Research society, held in Cleveland in March, it was voted to have the annual convention of the society at Pittsburg the week of October 4th, this meeting to be in conjunction with that of the Interstate Anesthetists association, and the Pennsylvania Medical society. It is possible that the Western Pennsylvania Dental association also will join in the meeting.

In order to augment interest in the primary purpose of the Society, which is research, the Governors voted two hundred dollars to be apportioned in prizes for the best papers on research in anesthesia, such papers to be read at the national meeting. This offer is open to all students, surgical, medical, and dental practitioners in the United States.

Canvass of hospitals having revealed need for a uniform anesthesia chart, a committee of three was appointed to prepare forms. The committee consists of Dr. A. F. Erdman, of Brooklyn, Dr. A. H. Miller, of Providence, and Dr. E. I. McKesson, of Toledo. It was also decided to prepare and publish at the earliest moment possible a monograph on the best practices in anesthesia in obstetrics.

Announcement was made of the acceptance of the following well-known physicians, dentists, and anesthetists as members of the Research committee: F. C. Mann, Rochester, N. Y.; John Evans, Buffalo, N. Y.; A. E. Guedell, Indianapolis, Ind.; Wm. Harper DeFord, Des Moines, Ia.; W. E. Burge, University of Illinois; Wm. Hamilton Long, Louisville, Ky.; J. Griffith Davis, Baltimore, Md.; J. J. Buettner, Syracuse, N. Y.; Dr. Tyler, Philadelphia, Pa.; Isabella C. Herb, Chicago, Ill.; A. F. Erdman, Brooklyn, N. Y.; A. H. Miller, Providence, R. I.; W. B. Howell, Montreal, Canada; R. S. Hopkinson, Milwaukee, Wis.; Oel E. Lanphear, Kalamazoo, Mich.; W. I. Jones, Columbus, Ohio; Theo. Casto, Philadelphia, Pa.; S. P. Reimann, Philadelphia, Pa.; John Polak, Brooklyn, N. Y.

SOCIETY ANNOUNCEMENTS

Psi Omega Fraternity

The Reunion and convention of the National Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, July 12, 13 and 14, 1920.

Michigan State Dental Board

The next meeting of the Michigan State Dental Board for examinations will be held at Dental College, Ann Arbor, Michigan, June 14-19. Any one interested, communicate with the secretary.

B. S. SUTHERLAND, *Secy.-Treas.*, Owosso, Mich.

Indiana State Board

The next Indiana State Dental Examination will be held in Indianapolis, June 14th to 20th inclusive.

Applicants will be accepted from class A and B colleges.

Preliminary educational certificates must be examined by State Superintendent of Public Instruction two weeks in advance of the examination.

For further instructions and application blanks, address H. C. McKittrick, D.D.S., 1006 I.O.O.F. Bldg., Indianapolis, Ind.

Pennsylvania State Board

The next meeting of the Pennsylvania Board of Dental Examiners will be held in Philadelphia and Pittsburgh, on Wednesday, Thursday, Friday and Saturday, June 23, 24, 25 and 26. The theoretical examinations will be held at Musical Fund Hall, 808 Locust Street, Philadelphia, and at the College of Pharmacy, Bride and Bluff Streets, Pittsburgh. These examinations will begin on Wednesday, June 23rd, at 9:00 A. M., and will continue Thursday and Friday. The examination in practical work will be held on Saturday, June 26th, at 8:30 o'clock, and will be held at the Evan's Dental Institute, 40th and Spruce Streets, Philadelphia, and at the University of Pittsburgh, Pittsburgh. Application papers may be secured from the Department of Public Instruction, Harrisburg. For further information apply to Dr. A. H. Reynolds, secretary, 4630 Chester Avenue, Philadelphia.

Yours very truly,

ALEXANDER H. REYNOLDS,
Secretary to the Board of Examiners.

Vermont State Board

The next meeting of the Vermont Board of Dental Examiners for the examination of candidates to practice in Vermont, will be held at the State House, Montpelier, June 28, 29, 30.

Candidates will present for registration and preliminaries at ten A. M., Monday the 28th.

To be eligible for examination a candidate must be (1), twenty-one years of age; (2), a graduate of a high school of the first class; (3), a graduate of a reputable dental college.

Applications must be in the hands of the secretary not later than June 21st.

For further information and application blank, address,

HARRY F. HAMILTON, *Sec'y*,
Newport, Vermont.

Wisconsin State Board

The next examination of the Wisconsin State Board of Dental Examiners will be held in Milwaukee beginning June 21, 1920.

All applications and credentials must be in the hands of the secretary at least ten days before the examination.

Full information and application blanks may be received by addressing,

WILLIAM KETTLER, *Secy.*,
801 3rd St., Milwaukee, Wis.

Wisconsin State

The fiftieth annual (Golden Jubilee) meeting of the Wisconsin State Dental Society will be held at Milwaukee, Wisconsin, July 13-14-15, 1920.

Very respectfully,
DR. W. F. FAUST, *Secy.*,
308 North avenue, Milwaukee, Wis.

Idaho State

The next meeting of the Idaho State Dental Association will be held in Pocatello, June 28th to July 3rd.

The services of Drs. F. Ewing Roach and Arthur E. Smith, of Chicago have been secured for the post-graduate classes.

M. J. GOODE, *Secretary*,
Filer, Idaho.

West Virginia State Board

The next meeting of the West Virginia State Board of Dental Examiners will be held in Bluefield, W. Va., beginning at nine o'clock on Tuesday morning, June 22, 23 and 24, 1920. For further information and application blanks, address

R. MASON HITE, *Secretary*, Mannington, W. Va.

South Carolina State

The annual meeting of the South Carolina State Dental association, will be held in Columbia, S. C., Jefferson Hotel, June15-16-17.

Respectfully,
Greenville, S. C. EMET C. DYE, *Secretary.*

South Carolina State Board of Dental Examiners

The next meeting of the South Carolina State Board of Dental Examiners will be held at the Jefferson Hotel, Columbia, S. C., beginning at 9:00 o'clock, Friday morning, June 11.

Further information and application blanks may be obtained by addressing Dr. R. L. Spencer, Secretary, Bennettsville, S. C.

Florida State Dental Society

The next annual meeting of this society will be held in Miami, Fla., June 15, 16 and 17, at Hotel Plaza.

H. B. PATTISHALL, *Secy.-Treas.*, Jacksonville.

American Dental Library and Museum Association

The next annual meeting of the American Dental Library and Museum association will be held August 23, 1920, 3:30 P.M., at the Forsyth Dental Infirmary, Boston, Mass.

The list of applicants for membership in the association have exceeded our expectations and we trust that all those interested in dental libraries and museums will forward their applications as soon as possible.

We expect to hold several sessions in Boston. At one of these will be discussions and papers that will be of interest to librarians, historians and curators.

The objects of the association are the creating and fostering of dental libraries and museums, and the maintenance of a system for exchange of dental literature, reprints, etc.; as well as gathering material for museums, securing and distributing the transactions of all dental societies.

Membership: Any Dental Society, Association, University, College or Library, having a permanent home and a Dental Library. Any individual interested in dental literature or libraries.

Benefits: The banding together of a united body with a common cause. The betterment of conditions in dental libraries. A clearing house through which books, journals, reprints, *or lists of these,* may be sent from one library to another.

We desire to know what libraries now exist and how many would be interested in the association.

Application blanks will be forwarded upon request.

B. W. WEINBERGER, *Secy.-Treas.*,
40 East 41st street, New York City.

NATIONAL DENTAL ASSOCIATION ANNOUNCEMENTS

Announcement

The National Dental Golf Association was organized at New Orleans, last October, and temporary officers elected.

The first tournament will be held in Boston, on the Woodland golf course, Monday, August 23, 1920, during the meeting of the National Dental Association.

It is purposed to effect a permanent organization at that time. Officers will be elected, committees appointed, and suitable Bylaws adopted.

It is desired that all members of the National Dental association, interested in golf, should become affiliated. An effort is being made to supply such persons with application blanks. There is an application blank at the end of Chick Evans' article on "Why professional men should play golf," published in the April issue of the *Journal of the National Dental Association.* A blank may also be secured from the secretary-treasurer.

You should join the association whether you expect to attend the Boston meeting or not. The admission fee is three dollars, paid but once, and no other fees will be charged except to those who participate in the tournaments.

The following events have been suggested for the Boston meeting:

Thirty-six hole medal play for association championship; thirty-six hole handicap medal play; thirty-six hole against par; thirty-six hole handicap against par; best ball two-some for thirty-six holes (less one-half total handicap); best ball four-some for thirty-six holes; eighteen hole handicap medal play, (morning); eighteen hole handicap against par, (afternoon); low net medal score for best nine holes, (morning); low medal score for best nine holes, (afternoon).

While it is the intention of the association to conduct an annual tournament at the time and place of the National Dental Association meeting, it is not proposed that it shall in any way interfere with the scientific program.

The following is a tentative draft of Bylaws to be submitted at the meeting for consideration and adoption:

Name—The name of this association shall be The National Dental Golf Association.

Executive—The organization shall be governed by six directors, three of whom shall be chosen by the members of the association at each annual meeting. They shall hold office until their successors are elected and qualify. They shall be known as president, vice-president and secretary-treasurer, respectively, and their duties shall be such as usually pertain to the respective offices. The three last retiring presidents of the association shall be directors of the association.

Funds—To provide funds for administration and for advancement on tournament expenses, the following dues and fees are required:

First, an enrollment fee of three dollars for the general funds of the association, to be paid upon enrollment as a member of the association. This may be at any time. The payment of this perpetuates the membership. Once a member, always a member.

Second, a playing fee of one dollar for the tournament fund of the association. This fee, and all hereafter are payable at the first tee, and shall be paid only in the event that the member enter the tournament, the idea being that aside from the enrollment fee, all expenses are paid by those who participate in any year.

Third, the tournament fees. There shall be paid then, at the first tee, by all entrants to the tournament, fees as follows:

(*a*) The playing fee of one dollar above mentioned.

(*b*) The enrollment fee of three dollars above mentioned, if not already a member.

(*c*) The greens' fee, charged by the local club as arranged for by the local committee.

(*d*) The dinner fee, as determined by the local committee in charge.

Membership—Any male member of the N. D. A. in good standing, who has the degree of D.D.S., becomes automatically a member of this association upon acceptance of its Bylaws, and payment of the enrollment fee.

Play—No member shall enter play except upon payment of the prescribed fees.

The Tournament—Shall be held either just before, or during, or just after the annual meeting of the N. D. A.; the time and place to be determined in advance by the directors cooperating with a local committee of their own choosing; provided that the time shall not be in conflict with the scientific programs of the N. D. A.

Handicaps—Handicaps shall be limited to eighteen; members playing in any competition must play on their lowest club handicap, and when playing on their own club course shall be penalized two strokes.

The Annual Dinner and Meeting—Shall be held on the evening of the day of the tournament.

Accounts—No accounts shall be kept with the members. All privileges automatically follow compliance with the provisions of the Bylaws.

Amendments—These Bylaws may be amended at any annual meeting by a three-quarter vote of the members present; or between meetings by a three-quarter vote of the members who register their votes by mail within two weeks after a call therefore is made.

Any further information will be gladly furnished upon request.

F. M. CASTO, *Chairman*
464 Rose Building, Cleveland, O.

RALSTON I. LEWIS, *Secretary-Treasurer*
25 E. Washington St., Chicago, Ill.

An Appreciation

It is most difficult to adequately frame an expression of appreciation to Dr. Carmichael, which can do justice to the Course of Instructions at his hands.

We will however go home feeling that we have a much better knowledge of how to make dependable bridgework, and also how to diagnose and properly treat the various types of pyorrhea and mouth infection.

We certainly take great pleasure in recommending him as a teacher of wonderful ability. We feel sure that anyone taking the "Carmichael Course," will come away feeling that in addition to all the instruction received it was good to know Dr. Carmichael.

EDGAR F. LEWIS, D.D.S., Rochester, N. Y.
HENRY B. FULTON, D.D.S., Rochester N. Y.
HOWARD F. LEWIS, D.D.S., Rochester, N. Y.
J. DONALD SMITH, D.D.S., 1003 E. Market St., Akron, O.

May 8th, 1920

SUGGESTIONS

CONDUCTED BY F. R. CHAPMAN, M.S., D.D.S., COLUMBUS, OHIO

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

To Locate a Root Canal

Sometimes when we have lost the course of a canal, apply a small drop of iodin, allow it to remain a few moments and then remove it with alcohol. A small amount will penetrate the unopened canal and by placing the transilluminating lamp alongside the tooth it will so illuminate the inside that we can easily locate the tiny dark spot which is the entrance to the canal. Then, by placing a very rigid instrument on this spot we can force our way into the remainder of the canal.

—E. S. B., Journal, N. D. A.

To Convey Medicaments

For conveying medicaments below the free edge of the gingiva such as $AgNO_3$, iodin, trichloracetic acid, etc., I know nothing that acts so well as thin bamboo. When on duty at the Langwarrin V.D. Camp, I always used bamboo carriers when treating patients that were suffering from mercurial stomatitis and other inflammatory conditions where it was necessary to apply such medicaments. An old Japanese blind will supply all the material required; with a sharp knife, extremely thin shaving, any size and width, can be cut that will retain their rigidity.

—G. C. Nicholson, Commonwealth Dental Review.

A Short Cut in Plate-Polishing

Our method consists in using the bristle polishing brush on the wax trial-plate in much the same way that it is used upon the vulcanite plate.

This process smooths down the bumpy places; cuts down the climbing wax from around the crowns; rounds the interdental wax, and reduces to desired fullness. The next thing is to remove the scratches left on the wax by the bristles. This is easily done by going over the wax with a rag or pledget of cotton, wet with coal oil. This leaves a very smooth surface, to which it is almost superfluous to add by rubbing soapstone over the wax, but as this can very readily be done when soapstone is used for separation of flask, it is well to employ it. By this easy method we get a vulcanite plate which, after it comes from the vulcanizer, is readily finished with pumice and chalk—no scrapers, no sandpaper.—*Stewart J. Spence, Dental Digest.*

To Fit a Backing to a Tooth

A simple, effective and quick method for this purpose is to mark and cut holes in the backing and fit it over the pins. Press the pin side on a Faber eraser and bend the eraser up over the tooth. Place on the bench and strike the eraser with a hammer. The backing will fit well. The porcelain will not crack or check.—*A. L. Roat, Dental Cosmos.*

Easy Method of Removing Regulating Bands

To remove regulating bands or crowns, grasp the band with forceps and squeeze with firm pressure, repeating the process around the tooth if possible. This will loosen the cement and may even expand the band so that it can be easily removed.—*F. W. Stephan, Dental Facts.*

Anneal a Lingual Bar

In the construction of lingual bar cases for partial lower dentures where the bar is to be soldered to gold saddles, the bar should be thoroughly annealed after bending and final adjustment has been completed, otherwise the heating in soldering will cause the bar to spring, and the case will not go back to place properly on the cast, and failure will result in the mouth. This result will also obtain in vulcanite cases unless bar is annealed before final adjustment.—*Victor H. Fuqua, Dental Facts.*

Pressure in Packing Amalgam

The hardness of amalgam is progressively increased with the increase of the percentage of silver. As the percentage of silver is gradually increased, the cut must be finer so as to render greater facility for mixing. The efficiency of amalgam is increased in direct ratio with the decrease of mercury. It is subject to less change in the mouth and grows in toughness and hardness accordingly. On this point Dr. Black said, "Use all the pressure at your command." There need not be any fear that too much mercury will be removed.—*Samuel Doskow, Dental Outlook.*

A Quick Filter

A nice and quick way to filter water for hypodermic use is to boil the water in a teaspoon over a common flame, place a small piece of absorbent cotton in the spoon, and draw the liquid into the syringe through the cotton. By so doing you get a perfectly clear solution.

—*Dental Surgeon.*

The Ney-Oro Series of Gold Alloys

THESE alloys for Prosthodontia and Orthodontia were developed by a metallurgist who knew by experience the requirements of various dental operations.

The value of this series of alloys is shown by the endorsement of dental bodies, by the incorporation of chapters relating to them in standard text books, and by their specification for Government requirements.

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NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

St. Louis University Launches Movement For $3,000,000 Endowment—School of Dentistry to be Extended

St. Louis, Mo., May 20.—The School of Dentistry of St. Louis University will be provided with a new building and another clinic out of the $3,000,000 endowment fund being sought by the alumni and friends of the university in commemoration of the institution's first one hundred years of service in the field of higher learning. More professors also will be added to the faculty of the dental school, according to an announcement by president William F. Robinson, S. J., of the university, and professors now on the teaching force will be given an adequate increase in salary, he said.

The income on one-half of the endowment fund will be used for increasing the salaries of professors in four of the colleges of the university, sixty thousand dollars of the money to be devoted to this purpose in the schools of medicine and dentistry. A total of $550,000 is to be used in providing for new clinics and buildings for the schools of medicine and dentistry.

Julius S. Walsh, a prominent banker of St. Louis is chairman of the centennial endowment fund committee, and James W. Byrnes, head of a large local industry is chairman of the executive committee in charge of the movement. George W. Wilson is treasurer of the fund.

Committees of alumni are being established in every state of the Union.

St. Louis University's School of Dentistry was opened in 1908, and since has been the only class A school of dentistry in this section of the country.

Twenty-five physicians and dentists have organized the Flint Medical Building Association, capital fifty thousand dollars, and will erect a six-story office building at Detroit avenue and Fourth street.

Ninety-seven per cent. of the pupils in three New York city schools average nearly seven cavities per mouth, as shown by recent examination.

Dentists in Australia must now pay a surtax of £1 per ounce, making the price now about £5.2s per ounce.

It ought to be just about a penitentiary matter for proprietors of nostrums to cop out scientific stuff from dental and medical journals and use it for advertising purposes. The habit seems to be growing, and should be checked. It is very easy indeed for a writer of some skill to make his advertising stuff fit in with the stolen material, and appear to have actual authority of investigators behind it.

U. S. Army has provided means by which any man enlisting for service may take a course in dentistry and enter the Dental Corps when competent.

Dentists everywhere are trying to secure exemption from import duty for instruments and supplies from foreign countries; also to prevent the imposition of the ten-dollar-per ounce tax on gold. So far as the duty is concerned, it might be well to consider the American manufacturer before becoming too radical. There is much to be said on both sides.

Shelby county, Tenn., (Memphis), has purchased and installed a dental ambulance that will visit every school in the county.

If you feel that you must advance your fees, and don't know just how to go about it and still retain your standing in your community as a fair-minded citizen, write me; perhaps I can help you. Have helped others.

Hint in Pyorrhea Treatment—See that your patients stop eating heavily salted foods, salt meats of all kinds, and prescribe an antiscorbutic diet, including plenty of raw fruits, vegetables, etc. Some cancer authorities are beginning to suspect diet as lying at the root of that dread disease. Too much cooked food, too much chlorid of sodium, not enough raw green stuff, not enough coarse grains—these and the sugar craze are filling graveyards and keeping the pyorrhea specialists busy.

"Don't let your teeth ache; ask your dentist why," sounds like a mighty good slogan to get into the mouths and the minds of the coming generation, and here's another: "an aching tooth is a sick tooth; sick teeth never get well."

Visitors at the Grand Rapids, Mich., public clinics last year numbered 3,785. The clinics were founded by Dr. E. S. Holmes Dental Club, about ten years ago.

Dr. Sidney Rauh, Dr. Emerson A. North, Dr. Louis Striker, all of Cincinnati, take issue with Dr. Henry A. Cotton, New Jersey scientist, on his statement that insanity may be caused by diseased teeth; that, in fact, insanity is more frequently the result of diseased teeth than of diseased brains. The Cincinnati gentlemen hold that the theory is merely a phase of the fad that seeks to attribute all diseases to the teeth. Dr. Rauh says that an impacted third molar may cause insanity, but its action is mechanical rather than toxic.

Miami, Okla., has imposed an occupational tax of ten dollars per year on dentists, doctors and lawyers; five dollars per year on all other professions. Why the discrimination?

Dr. Edwin Matthews, Maysville, has been appointed a member of the Kentucky state board of examiners.

Settlement of 127,151 insurance claims, for death and total permanent disability, and representing a total value of $1,135,552,173.45, is announced by director R. G. Cholmeley-Jones of the Bureau of War Risk Insurance. Only 5,119 claims are pending, and in these cases the claimants are beneficiaries in many instances residing in foreign countries where disturbed conditions render communication impossible.

It now requires only about five days from receipt of final evidence of death in an insurance case for the issuance of the first check, and frequently cases have been handled even more rapidly in the Compensation and Insurance Claims Division of the Bureau.

In cases of total permanent disability, men have been examined, the award made, and the first check placed in their hands, all within a very few hours.

U. S. Public Health Service

DENTAL EXAMINERS APPOINTED BY THE BUREAU OF WAR RISK INSURANCE SINCE LAST REPORT

Cheboygan county, Mich., Dr. A. E. Sangster, Cheboygan; Rome, N. Y., Dr. Harold E. Dorn; Red Lake county, Minn., Dr. A. E. Lucian, Red Lake Falls; Yonkers, N. Y., Dr. Victor A. Martin; Alta Vista, Ia., Dr. L. A. Kieren; Greene county, Ohio, Dr. E. J. Reynolds, Xenia; Mercer county, Ill., Dr. W. W. Moorehead, Aledo; Hibbing District, Minn., Dr. Wilbur Wring, Hibbing; Delaware county, N. J., Dr. Leroy D. Neish, Walton; Wood county, Ohio, Dr. T. M. Lea, Bowling Green; Litchfield district, Minn., Dr. A. C. Nelson, Litchfield; Davies county, Ky., Dr. O. B. Heavrin, Owensboro; Fulton county, Ind., Dr. Perry Heath, Rochester.

News From Southeastern Ohio

Cambridge, Ohio, April 22.—During the past four months eight dental offices along the Ohio river have been robbed, between Steubenville and Marietta. During the week of April 22, Dr. R. H. McNickel, Martin's Ferry, suffered a heavy loss in gold. Safe was jimmied.

Five dentists of southeastern Ohio have died quite recently, all within a period of six weeks, Drs. W. T. Simms, Martin's Ferry; C. H. Devore, Woodsfield; J. R. McGinnis, Summerfield; F. L. Cary, Zanesville; Hamlin Barnes, Wellsville. I attended the funeral of Dr. Barnes, a very good friend. He had been ill about two months; seemingly recovered and resumed practice, only to die very suddenly of acute indigestion.

On June 17, 1919, I was a guest at an honorary banquet tendered Dr. Barnes by the East Liverpool society, at which most splendid tribute was paid to him, both as man and dentist. An appropriately engraved insignia ring was presented to Dr. Barnes, and a handsome floral piece sent to Mrs. Barnes on the occasion. More such occasions would enliven the practice of dentistry and help to make life worth living.

My good friend Dr. F. A. Wernert, Coshocton, died April 9, after an illness of three months of kidney trouble. He was born of French parents, March 22, 1842, and had practiced about forty-five years. He was a prominent Mason. His invalid wife, a daughter, and a son practicing dentistry in Detroit, survive him.

J. W. Newell.

Indiana—State

The sixty-second annual meeting of the Indiana State Dental Association, Claypool Hotel, Indianapolis, May 17-20, was a record-maker in more ways than one. Despite the unfavorable weather, the attendance was very large, probably the largest in the history of the association, while the proceedings were of tremendous interest.

The reports of the various committees were unusually well prepared. As they are part of the history of the association, they will appear in The Summary in due course.

President Harry C. Carr, read an address that should be read by every dentist, carefully considered by every officer of every dental organization, particularly as it is Dr. Carr's farewell address to dentistry, his health making it necessary for him to seek other lines of activity for the present.

However, the cap-sheaf of the entire meeting was the presence of and able contributions by Dr. T. B. Hartzell. At the afternoon session his address on "Pyorrhea and Its Treatment," was revolutionary almost to the extreme. As Dr. Hartzell is to appear at the Northern Ohio meeting the second week in June, further comment would be out of place, except to say that when his method becomes general, the treatment of pyorrhea must cease to be the bug-bear to the profession that it always has been.

At the Monday evening session, Dr. Hartzell very ably read himself out of the "One hundred Per Cent. Extraction Club," in which, as a matter of fact, he never has held membership except by common reputation. His lecture "When to Extract and When to Conserve Diseased Teeth," delivered without manuscript or notes, marked him as a most able man who had devoted years of study to his subject. A close reading of this lecture when it appears in THE SUMMARY, will save many a dentist from regrettable mistakes.

Dr. Norman B. Nesbett, with his usual ability and clearness, carried his audience through "A Simple Form of Removable Bridge, without Extensive Multilation."

The program was enlivened by the exhibition of several health-films supplied by the U. S. Bureau of Public Health.

Papers by Drs. Hessler, Carl D. Lucas, and Robert Gillis occupied the time of "Indiana Day," Wednesday afternoon. John Paul Jones and Boyd S. Gardner appeared in the evening of Wednesday, with a message from the Mayo Clinic.

Thursday was devoted to clinics, most of which were of unusual interest.

A. R. Ross was chosen president; C. R. Jackson, Indianapolis, president-elect; A. J. Kimm, Evansville, re-elected secretary and C. A. Priest, treasurer.

New York—Third District

Troy, N. Y., April 25.—At its fifty-second annual meeting, Wednesday, the Third District Dental Society elected: President, E. H. Gale, Albany; F. L. McCormick, vice-president and Porter S. Oakley, treasurer, both of Troy; secretary, F. J. McKeon, Albany; correspondent, D. K. McDonald, Albany; editor, L. R. James, Hudson, and librarian, F. E. Kunker, Albany.

West Virginia—State

Charleston, W. Va., April 15.—Officers elected today at the meeting of the West Virginia State Dental Society were as follows:

J. W. Mahan, Charleston, president; W. S. Rosenheim, Williamson, first vice-president; George C. Howard, West Union, second vice-president; N. P. McDermott, Charleston, secretary.

The delegates selected for the national convention were: R. J. Kail, Huntington; J. W. Mahan, Charleston; G. C. Howard, West Union. The alternates are: Homer Mannon, Huntington; A. R. Marple, Huntington and J. W. Boydson, Fairmont. Bluefield was selected for the next meeting place of the society.

Connecticut—State

New London, Conn., April 21.—The Connecticut State Dental Association elected officers today as follows: President, F. J. Buchan; vice-president, Martin J. Loeb, New Haven; secretary, Clesson F. Gibbs, Bridgeport; treasurer, John L. Barton, Hartford; executive committee, Arthur B. Holmes, Waterbury, Ralph H. Keeler, New London, and F. S. Frary, New Haven. About three hundred dentists were present.

Tennessee-Arkansas-Mississippi—Tri-State Club

Memphis, Tenn., April 15.—Out of the spring clinic given annually by the Memphis Dental Society, there was organized yesterday, the Tri-State Dental Clinic Club, composed of dentists from Tennessee, Arkansas and Mississippi. The only qualification for membership is that the applicant must be an ethical practitioner. The membership fee is five dollars a year.

The club will meet annually in the fall of the year, and all clinicians will be drawn from the three states represented. This club will in no way affect the local society, which will continue to give its spring clinics as heretofore.

Officers of the new club were elected as follows: Douglass Hood, of Tupelo, Miss., president; Earl J. Loge, of Pine Bluff, Ark., C. A. Seyier, of Jackson, Tenn., and E. O. Moore of Clarksdale, Miss., vice-presidents; C. E. Hines, of Memphis, secretary and treasurer.

Mississippi—State

Jackson, April 20.—At tonight's session of the Mississippi Dental Association J. N. C. Moffatt, of Shelby was elected president; J. E. Hodges, of Oxford, vice-president; C. K. Bailey, of Grenada, treasurer, and R. B. Warriner, of Corinth, journalist. W. F. Barnes, of Meridian was named at last year's meeting as secretary for a term of three years. Jackson was selected as the next meeting place.

Montana—Billings

Billings, Mont., April 13.—Billings dentists last night took preliminary steps toward effecting a permanent organization of members of their profession in eastern Montana and northern Wyoming. At a meeting held in the Northern hotel, F. J. Kimmel was elected president of the new organization, G. T. Taylor, vice president, and F. J. Bell, secretary-treasurer. Adoption of a name for the association and the completion of other organization details will be taken up at a later meeting.

The organization will have among its purposes the establishment of dentists' clinics to treat children of the poor; educational clinics to acquaint members with the latest processes, and post-graduate course for members.

Texas—Southeastern

Beaumont, Texas, March 19.—J. P. Evans of this city was elected president of the Southeast Texas Dental Association, at the organization meeting last night, in the Perlstein building. Frank Clann, of this city was named secretary and E. P. Shaw, of Port Arthur was elected vice-president. The by-laws committee is composed of C. H. Walker, E. D. Ames and J. E. Storey.

Teeth As Jewelry

Time of Queen Anne. Lost—About two months ago, a ring with a tooth set in it. Whoever will bring it to Mr. Green, Goldsmith, in the Minories, shall have the value of it.

—*The British Dental Journal*

A patient, Mrs. H. wears a bracelet, to which is attached by a gold chain, a five dollar gold piece which has three small gold sockets soldered to it, into which are cemented three temporary teeth taken from the mouth of her daughter, an only child.—*N. L. Ambler*

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Sincerely yours,

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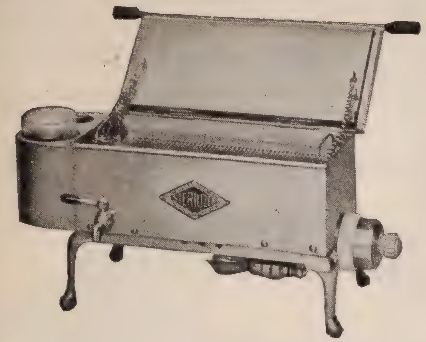

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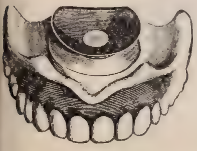

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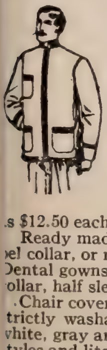

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Arkansas—State

Little Rock, May 15.—The annual meeting of the State Dental Society took the form of a series of post-graduate classes, Charles W. Freeman, N. W. U., covering the subject, "Nerve Blocking;" E. B. Owens, St. Louis, "Prosthetic Dentistry;" L. J. Weinstein, New York, "Removable Bridgework;" the classes covering the entire five days of the meeting. The Arkansas Society is almost synchronous with the ethical practitioners of the state, there being now but very few outside the fold.

DEATHS

At Louisville, Ky., April 26, Dr. Charles E. Nary, during a fit of temporary insanity, attacked his wife with a paring knife, and then cut his own throat with fatal results. His wife had asked him for an additional allowance for household expenses, made necessary by tremendous costs. This and other troubles upset his reason for the time being. At last accounts the wife was in critical condition.

At New Brighton, Pa., April 26, Dr. A. M. Whisler, aged 71.

At Newark, N. J., April 24, Dr. George D. Cook, aged 68.

At Wellsville, Ohio, April 16, Dr. Hamlin Barnes, aged 70 years. He had practiced over thirty years, was at one time Mayor, and a leader in the anti-saloon movement.

At Ames, Ia., April 21, Dr. Norman Drake committed suicide on account of chronic ill health.

A Sanitary Novelty

It cannot be denied that a tooth brush is one thing that cannot be too sanitary; too clean. Disease germs introduced directly into one's mouth are apt to do deadly work.

Many people have a habit of laying the tooth-brush on a window sill or standing it upright in a glass after using. The window opens on a street; most of the year that window is open, and street dust is perfectly free to blow in on the brush. Street dust is quite likely to contain germs.

A new type of brush recently placed on the market is designed to combat this condition,

SAL HEPATICA
MATERIALLY AIDS
Local Treatment in
PYORRHEA
Bristol-Myers Co.
New York

It has a folding handle. The end is in the shape of a hollow socket which folds back over the brush, entirely enclosing it and preventing any foreign substance being deposited on it while not in use.

The new brush is especially desirable for travellers. It can be folded up and thrown into a bag while wet. Soiled clothing cannot come in contact with it.

The handle pocket is made of transparent sheeting, made of pressed, hardened pyroxylin plastic; about the same material, in fact, (albeit a little heavier) from which auto window curtain lights are made.

The new brush has many features to commend it to those whose thoughts dwell on sanitation.

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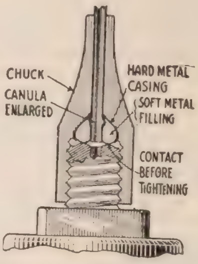


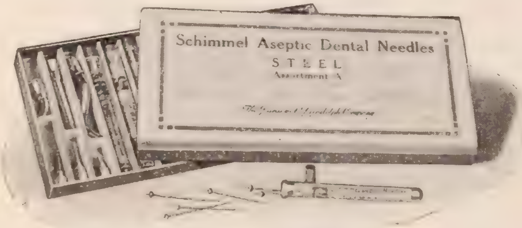
1. Leaking is prevented without the use of washers of any kind. (See illustration.)

2. Breaking is reduced to the minimum, since, in use, the needle is reinforced by the entire length of the chuck. Much superior to any soldered needle. (See illustration.)

3. The solution cannot come into contact with threads of questionable cleanliness. (See illustration.)

4. Any length of point may be obtained, from ⅛ to 1⅝-inches, by the use of different Chucks.

5. Replacements are less costly than with other high-grade needles.



For the convenience of our patrons, we pack all *nickel* and *steel* needles in handy assortments, made up to meet the requirements of the profession as developed by experience. The Assortments are complete, with necessary chucks and connections.

Assortment "A," in nickel and steel, contains:

2 tubes, 6 ea., ¾-in. 4 tubes, 6 ea., ⅞-in. 4 tubes, 6 ea., 1 -in. 2 tubes, 6 ea., 1⅝-in.	1 each Chucks B, C, G 1 each Connections D, E, F	Price, Nickel **$10.00** Price, Steel **$9.00**

In ordering say "Assortment A," and specify *nickel* or *steel.*

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With an aggregate consumption of 184,000,000 tons of coal in 1919, the Railroad Administration reports that in the first nine months of the year it effected a saving of 10,000,000 tons. In order to bring such an amount of coal within the understanding of the average man is estimates that the coal it saved would make a train 2,064 miles long—or a string of coal cars extending by the Pennsylvania from New York to Chicago, back to New York by the New York Central, and doubled on itself as far as Albany—almost a week's production in the United States!

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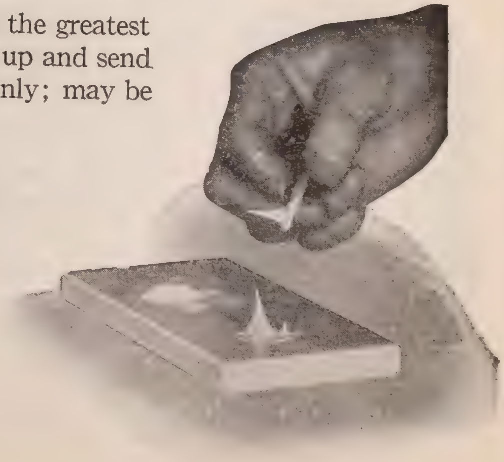

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July—New Jersey; 13-14-15, Wisconsin, Milwaukee.

November—18, District of Columbia, George Washington University, Washington, D. C.; Arizona, Phoenix.

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TOLEDO, O. U. S. A.

REGULAR CONTRIBUTIONS

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL July 1920 No. 7

TAKING THE CORRECT BITE*

BY DAYTON DUNBAR CAMPBELL, D.D.S., KANSAS CITY, MISSOURI

SPECIAL LECTURER DENTAL PROSTHESIS, KANSAS CITY WESTERN DENTAL COLLEGE
FOUNDER AND PRESIDENT OF CAMPBELL SCHOOL OF PROSTHETIC TECHNIC

THE PHRASE, "Taking the Bite" is reluctantly employed as a caption. However, at present its usage makes it best adapted to convey the ideas which the writer seeks to present in this article. "Taking the Bite" conveys to the dentist's mind the process of securing the proper relation of the jaws in such a way that this relation may be maintained between the casts when they are mounted upon an articulator.

DEFINITION OF CORRECT BITE

The correct bite is a relation of the jaws at closing when the condyles are in their most retruded position. Rarely, this retrusion is too pronounced—so rarely that in this article we shall not deal with such a case.

PREPARATIONS FOR TAKING THE BITE

When adequate preparation has been made for performing an act or accomplishing a purpose the performance or accomplishment itself is often the least spectacular phase of the entire series. The less experience the dentist has had in taking the bite the greater the probability of his success if he exercises proper precaution in constructing occlusion models. Dentists as a rule do not make adequate preparation for this process. The bases are rough and poorly adapted, the wax is uneven and of unsuitable texture, the occluding surfaces too hard and mal-aligned. So far as the writer is aware there never has appeared in print a definitely outlined method of procedure. It is the purpose of this article to outline a definite procedure and to show the essential character of each step.

The bases usually are constructed of modeling compound, sheet tin, or some proprietary preparation containing a large amount of shellac. Modeling compound necessitates wet heat which has a tendency to soften the cast; when used with dry heat it becomes sticky and unwieldy and finally, when cold, is too liable to fracture. Sheet tin, while admitting good results in the hands of an expert, is not readily obtained, has no affinity for the superstructure of wax, and is not as rigid as some operators require. Base-plate wax alone soon becomes distorted from the heat of the mouth. Shellac preparations are too easily broken. Gutta-percha compounds of Fuller's earth, talc or pumice stone commend themselves to the writer above any of the other materials that have been mentioned. The best of these in the writer's experience are sold under the trade names of Graft's Base Plate, Alston's Base Plate and Dentsply Base Plate Composition. These are not friable but are tough enough to preserve form or contour even when accidentally dropped; they are sufficiently rigid and are not influenced by body temperature. Economy will recommend the purchase of sheets for uppers only, since they may be converted into lowers. A sheet of this compound is warmed over a Bunsen flame until it begins to lengthen through its own weight, when it is placed upon the cast and adapted with the fingers. With the use of a chip blower, the flame is projected against the cold unyielding portions and then further adapted, using the blunt end of a spatula. The dentist will wish to extend this to include the roll of the border and where the material is too short it may be warmed and stretched sufficiently, and where too long it may be folded back upon itself and used to give additional strength. A piece of fourteen-gauge soft iron wire is bent to conform to the ridges of the lower, then flattened on an anvil and held with a pair of pliers in the flame until hot enough to easily imbed itself partly in the base plate material. This should be placed toward the lingual border so as not to interfere with the subsequent arrangement of the teeth.

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*This is the sixth of a series of twelve articles being written by Dr. Campbell, especially for THE DENTAL SUMMARY.

*EDITOR'S NOTE: Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

In building up the wax, two full-sized sheets of pink base-plate wax are warmed over the Bunsen flame, and as they are warmed uniformly they are folded and the folds passed through each other until the resultant body of wax is a homogeneous mass. This is formed into a roll about the size of a twelve-gauge shotgun shell and one end held in the flame while the dropping wax falls upon the crest of the base plate to form a layer to which the roll, when conformed to the ridges, will adhere more closely than if the operator attempted to heat the entire length of the roll and then apply to the ridge. When in place on the ridge the base plate is inverted, the roll pressed against a smooth surface and the excess cut out to conform to the universal gauge shown in *Fig. 1.* This is just one style of gauge and is used in both upper and lower. It may be made of metal or of fiber board. The size and form of the gauge may vary, it being necessary merely to keep in mind the purpose for which the gauge is to be used. The object in using the gauge is to construct each bite plate to conform to the gauge so that when both bite plates are placed in the mouth they will conform to each other.

The use of the gauge has come to be regarded by the writer as one of the abiding phases of Prosthetic Dentistry. It is one of the simple aids with which he would be loath to dispense.

Both occlusion models are built up higher than will be required; this is done because it is easier to cut these down to the desired height than to build them up while the patient is waiting in the chair. These models are contoured and finished as smoothly with wax and flame as it is possible to make them, in fact they are smoothed up as if they were to be worn out of the office. *Fig. 2* shows occlusion models ready to be placed in the mouth.

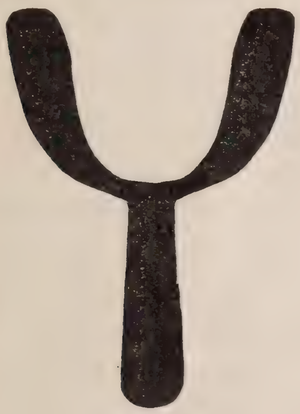


Fig. 1

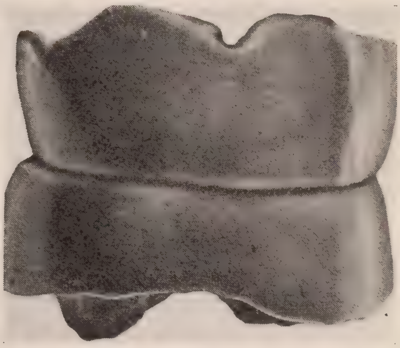


Fig. 2

Fig. 1—Universal gauge for occlusion models.
Fig. 2—Occlusion models ready to be placed in the mouth.

When the patient is placed in the chair these models are washed in cold water and the inner surface of the upper dusted with some patent preparation containing gum tragacanth, gum acacia or some similar ingredient that will keep the base in place during the subsequent operations necessary at this stage.

PSYCHOLOGY OF TAKING THE BITE

If the base drop down once during the operation, it often may be sufficient to fill the patient's mind with the foreboding idea that the finished denture will drop down in like manner, and before the dentures are inserted this patient is fully convinced that he will not be able to wear dentures at all—at least no dentures constructed by this particular dentist. Often the compound gutta-percha base has not been as well adapted to the base as the vulcanite will be, and consequently the maximum retention is not to be expected at this stage. However, even in the case of aluminum, gold or platinum bases this is an ill-chosen time to test the adaptation. The dentist ofttimes in his anxiety to have the base well adapted will give some facial expression at least to his misapprehension or disappointment in case it does not measure up to his expectation. The failure of the base to "stick" is by no means an indication that the finished denture will not be a genuine success. Neither is one that "sticks" a guarantee that the finished denture will not be a most miserable failure. The latter frequently depends, for its apparent close adaptation at first upon a large vacuum that, while shallow, covers most of the base. Where this condition exists firm pressure drives out most of the air and then atmospheric pressure becomes active, but after a week or ten days the tissues fill up the vacuum, overcoming the forces of atmospheric pressure and the denture no longer stays in place with that adaptation which was such a delight to the patient when it was first inserted.

PATIENT'S ATTENTION DEFEATS PURPOSE

Again, during the process of taking the bite no mention of "bite" should be made, because this word will convey to the patient a suggestion in keeping with his past reactions upon meeting with this word. Just as "gnaw" prompts him to get ready to exercise his "canines," "nibble" suggests a mincing use of the centrals and laterals, "chew," an excursion of food over the molars, so the word "bite" instinctively prompts a protrusion of the lower jaw as in the act of biting an apple.

One of the first elements in the psychology of taking the bite to be learned at the outset, if not already acquired through past experience, is that the patient should get the idea that every position of the jaw is exactly as the dentist would have it and that every closing of the jaw is correct. The writer means by this that there should not be aroused in the patient an anxiety about closing just right, since the very concentration upon the effort may defeat its accomplishment.

When a person, especially a child, "tries" to swallow a pill or a capsule, the act of swallowing often becomes an impossibility; a musician endeavors to follow each movement of his fingers as he plays a familiar selection and he finds himself floundering through an easy passage; perfectly-mastered series of coordinated reflexes as simple in their execution as walking, talking, or writing are the source of much confusion and embarrassment when the performer turns his attention to a particular phase of the series. As a rule, the more completely a person's mind is diverted from his method of executing a movement the more nearly will a normal movement result.

The writer recalls instances in which excellent operators have encouraged patients to swallow, bow head backward, have applied pressure to the chin, have shown by movements of their own jaws the kind of movement desired; all of these methods seem to the writer to be contraindicated. Exhibition on the part of the operator of impatience, peevishness, disgust or disapproval because of the patient's failure to close correctly delays the result and is *prima facia* evidence that the dentist does not know that taking the bite is something more than a physical or physiological procedure.

Suppose the bases are in position ready to take the bite. Let the dentist casually remark, "I wonder whether you can close your mouth with your new wax teeth," and the patient thrusts the jaw forward and to one side. "Fine," says the dentist. "Now see if you can do that again." This time the jaw lunges to the other side. "Good, you don't have any difficulty at all," and with a few more efforts accompanied by similar comments from the dentist, the patient brings the bases into correct apposition.

The dentist who does not have a supply of teeth readily available should determine the class, type, form, shade and mold for the individual case as early as possible—even before the impressions are taken, in order that they may be at hand when he is ready to take the bite.

ASSURING APPROVAL OF TEETH SELECTED

In giving the patient an appointment for a date when the bite is to be taken, it is wise to request that some intimate member of the family should accompany upon that occasion, wife, husband, son or daughter as the case may be. Suggest that this member of the family is desired to assist in the selection or arrangement of the teeth. The real assistance rendered by this person will be most significant when the patient returns home wearing the dentures. Sunken cheeks will have been more nearly rounded, lips will be full; it will be unusual indeed if the change is not as noticeable as a different hat or cravat—some members of the family may not approve of the style or color or appearance. This second member of the family has assisted in the selection and he or she may be counted an ally to defend the appropriateness of the selection against adverse comments.

Most patients know what they want but few know what they need, particularly is this true with reference to sizes and shades. Nearly every dentist is familiar with the expression, "Now doctor, my teeth were small and white." It usually is best to accept this bit of personal history without any discrediting remark, perhaps suggesting that, "I know from the color of your hair, your eyes and your complexion that you are going to be pleased with our selection." Choosing the whitest tooth (No. 1) of the shade guide and holding it in position in the mouth the dentist observes, and the patient usually is quick to concur, "This is much too light." Similarly, the darkest one of the shade ring is seen to be too dark. Then the dentist may select the tooth that is most suitable and, pronouncing it harmonious not only in shade but also in size, may expectantly look for both patient and visitor to agree. Selection is made easier when it is possible to keep the rest of the teeth of the shade guide from being brought into view.

REDUCING THE SHADE GUIDE TO FIVE NUMBERS

The writer uses Trubyte teeth almost exclusively, and the past achievement by the manufacturers of some splendid approximations to the colors of the natural teeth promises even more acceptable results in the future. Of the present shades, Nos. 14, 15, 16, 20, 22 are sufficient to meet the requirements of practically every case. A very pleasing combination of these shades and at the same time a combination which may be used in a large number of cases, is as follows: Centrals, No. 14; laterals, No. 15; cuspids, No. 16; bicuspids and molars, Nos. 14 or 16.

DETERMINING THE SHADE

In determining color or shade the dentist removes a tooth from the guide ring, moistens it upon the patient's lip or tongue, holds it in position and instead of fixating the tooth in line of vision focuses his eyes upon a point eight or ten feet behind the patient. When the tooth no longer is so light or so dark as to command marked attention or present too obvious contrast with its environment but rather blends with the whole complex of complexion and color of eyes and hair, an approach toward harmony is being made. Men who have made a physiological study of color recommend that fixation be of short periods only, since continuous fixation tires the optic nerve and makes fine discrimination impossible. Five seconds have been suggested as a limit after which it should be diverted for a moment. The æsthetic ideal is not yet standardized and harmony is influenced in large degree by the personal equation of the artist.

SELECTING THE MOLD

Often in selecting a tooth of large mold for a patient the set-up is given an undesired masculine appearance through the use of large laterals. All of the other teeth may be large and still not appear too large, provided precaution is taken to provide a lateral with a much smaller mesiodistal diameter. Where large stocks are available, a tooth from another set may be substituted or the skilful use of the carborundum wheel at the lathe will serve equally well.

TEETH SET CORRECTLY WILL APPEAR TOO LONG

It may be well to interpolate here that dentists almost universally make the mistake of cutting the lip line too high in the upper and too low in the lower, and as a result within a few months the teeth will appear too short. The reason for this is found in the fact that the lips over these improvised bases are not in true relationship. Consequently, after the dentures have been finished and worn for six months or a year, and the lips and cheeks have become more mobile and elastic and have returned to normal, they will more easily cover the teeth. This then gives them the appearance when first placed in the mouth of being too long. The dentist will keep in mind that the length of the tooth *should not be determined by the length of the patient's face*, if the short tooth makes it necessary to show a larger portion of the gums. The tooth cannot in any instance be too long with reference to the gum line. It is far better to show a very long tooth than to show too much of any artificial gum substitute that is obtainable today.

DISABUSING THE PATIENT'S MIND

In numbers of instances the patient comes to the dentist expecting that new dentures will completely restore youthful appearance and remove all crow's feet and wrinkles.

Some operators open the bite to a degree of discomfort in order to get a more acceptable cosmetic result through rounding the features under the chin and lifting the corners of the mouth. The writer believes it is good psychology to disabuse the patient's mind of such expectations and it may be done in the following way: Have the patient to step from the chair and stand before a mirror large enough to show head and neck and shoulders, at least. Grasp the tissue in the temporal region with the palms of the hands and raise the tissue of the cheek and neck as indicated in *Fig. 3*. The patient will immediately see that the desired reconstruction of features is obtained without dentures. This result may be made permanent through a minor surgical operation which consists in the excision of a sufficient portion just under the hair to relieve the patient of superfluous "wrinkle" or "furrow" tissue. *Figs. 3 and 3a* show unretouched photographs of an edentulous patient indicating this operation. The writer advises this operation in every instance where it is indicated.

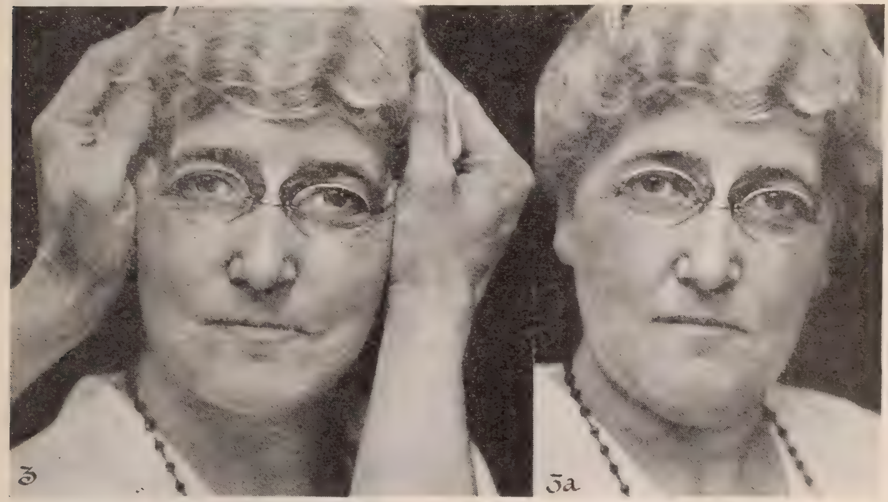


Fig. 3 Fig. 3a

Figs. 3 and 3a show method of disabusing patient's mind of idea that dentures will completely restore youthful features. Note condition under the chin, about the corners of the mouth and the alæ of the nose.

ARRANGING THE SIX ANTERIOR TEETH

With the upper occlusion model in position the lip line and the median line are indicated; then the upper is removed and a portion of the wax large enough to admit a central, lateral and cuspid is cut away bodily. The teeth are removed from the black carding wax one at a time, and a flame, directed with a chip blower against the pins, melts and then blows away every trace of the soft black wax. The hard base-plate wax is melted around the pins and the teeth mounted on the base by flowing additional wax around them. These are shown in *Fig. 4. Fig. 4a* shows these in patient's mouth.

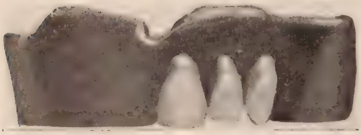


Fig. 4

Fig 4—Occlusion model with first three teeth in position.

Fig 4a—Maintaining the median line and lip line with teeth as they are to be incorporated in the finished denture.

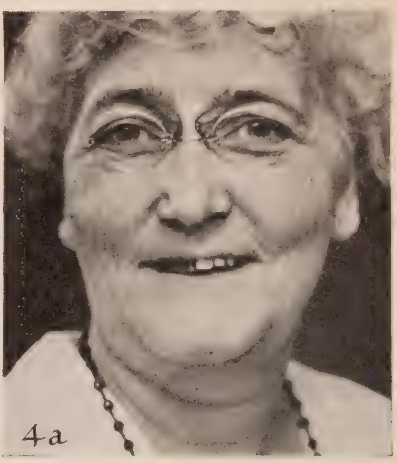


Fig. 4a

Since the lip line is now maintained by these three teeth, the adjoining section of wax may be removed and three more teeth put in position on the other side (*Figs. 5 and 5a*). The writer regards this as the most logical and most practical and most opportune time for arranging the six anterior teeth. In other methods the teeth are set up in the laboratory and when placed in the mouth it is these six which almost invariably require alterations in the alignment. With this method the alterations are eliminated. After the operator has arranged

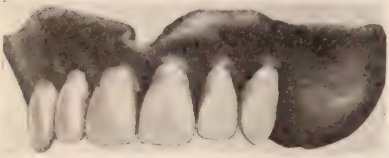
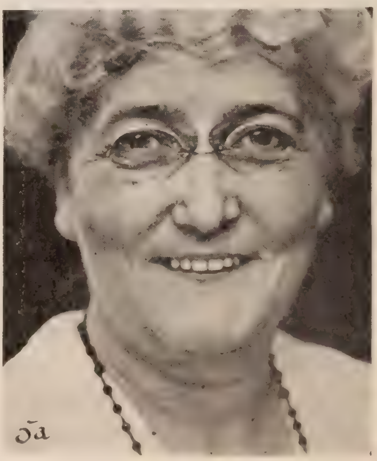


Fig. 5

Fig. 5—The six anterior teeth aligned preliminary to taking the bite and for the patient's inspection.

Fig. 5a—Final arrangement of the six anterior teeth embodying median line, lip line and contour before securing the bite.



·Fig. 5a

these according to his æsthetic appreciation of the cosmetic needs of the individual patient, the lapping or spacing may not be acceptable to the patient and to the one who has accompanied on this occasion. If the operator desires to lap the teeth or space them instead of setting them in regular alignment, it is well to exaggerate either of these aspects so that the desires of the patient and assisting critic may be conformed to when either of them suggests a modification. The dentist contributes largely to a successful case when he secures the cooperation of both of these persons and yet enables them to make his selections fully theirs.

The wax in the space to be occupied by the bicuspids and molars is sloped to a narrower width at the occlusal surface, so that when the jaws are closed the resistance to the soft wax will be minimized. The posterior border of each ridge is sloped off near the tuberosities as shown in the upper of *Fig. 6*. This is an additional precaution to avoid interference with the lower base.

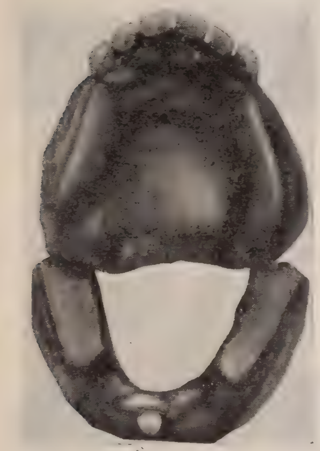


Fig. 6

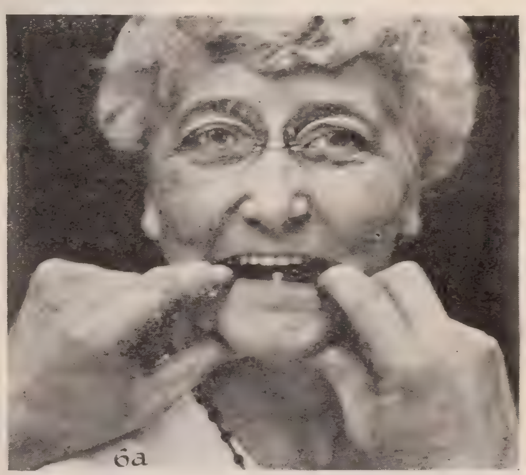


Fig. 6a

Fig. 6—Occlusion models just before the lower is pooled immediately preparatory to taking the bite.

Fig. 6a—The lower in position, with wax pooled ready for patient to close.

The upper occlusion model is now removed and the lower placed in position and the lip line indicated. After removing it from the mouth the wax is removed (*Fig. 6*) down to the base plate a distance on each side of the median line equal to the incisors and cuspids. The greatest single factor in securing the correct relation with this method is perhaps this absence in the anterior portion of the lower of anything upon which to bite. A lower central incisor (*Fig. 6*) is now waxed firmly in position, properly observing the lower lip line. This lower central is placed in the median line, or to either side—it will be moved to its correct mesio or distal relation when the teeth are all set up later. Its sole function now is to act as a stop when the mouth closes at the moment of taking the bite. The cutting edge of this lower central often follows the labial plane of the upper central and serves as the guiding factor in bringing the jaw into the desired retrusive position.

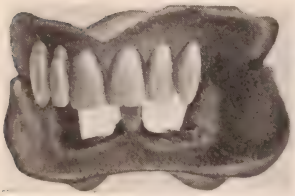


Fig. 7

Fig. 7—Another case showing occlusion models in correct relationship.

Fig. 7a—Occlusion models in correct relationship.

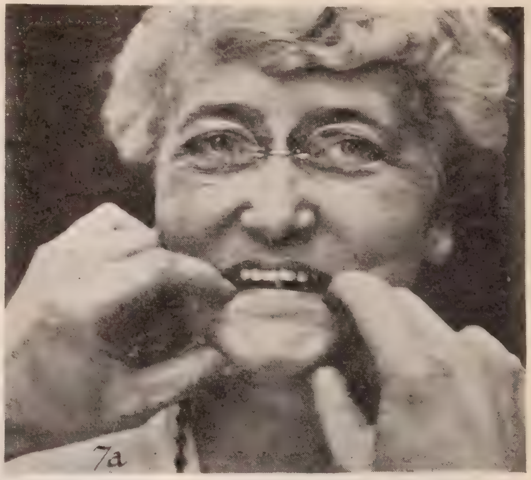
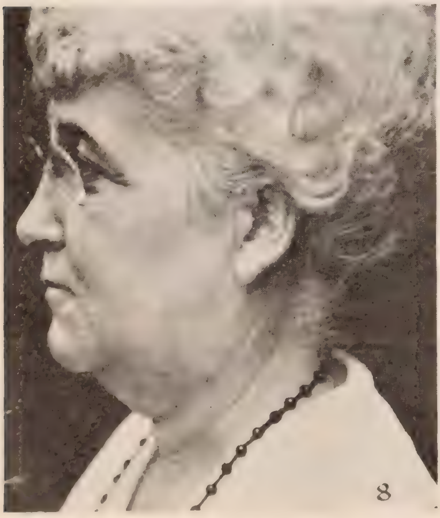


Fig. 7a

TAKING THE CORRECT BITE

The upper occlusion model is placed in position. The remaining wax of the lower—with the exception of the confining borders—is melted through to the base until it is a veritable pool of wax. In pooling the wax a sizzling hot spatula should be used and if a small portion of the wax is thrown away it will prevent the rest of the pool from overflowing. When the wax is congealed so that it no longer flows, it is returned to



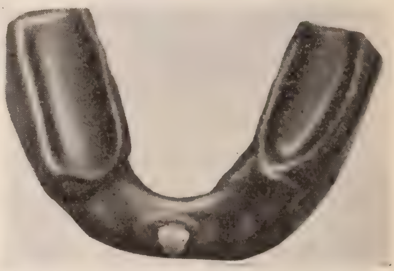


Fig. 9

Fig. 8—This view shows lips slightly protruding, the normal position when the jaws are closed.

Fig. 9—Lower after taking the bite—concave portions in bicuspid and molar regions are the female portions of the bite.

Fig. 8

the mouth where it appears as shown in *Fig. 6a.* The operator now employes the index finger of each hand to press the lower into position upon the mucosa, while the patient is requested to close the mouth (*Figs. 7 and 7a*). This is the first time that the two models have been in the mouth at the same time.

When the posterior portions of the two occlusion models touch, the patient gets a sensation prompting mastication, and instinctively he responds with the correct movement of his jaw to give the correct bite. When the cutting edge of the lower touches a point on the upper analogous to the cingulum or gingiva, the dentist halts the closing movement. The length of the over-bite is established; this is correct when the lips come together in normal fashion—they will appear full and slightly protruded as they will be naturally when the teeth are together. The profile view of *Fig. 8* shows the lips when the jaws are closed. After the wax has been allowed to cool for a minute or two both upper and lower may be removed together or separately and immediately chilled. Note impression of upper in lower as shown in *Fig. 9.* No marks or staples are necessary since with this method the operator has the assurance that upper and lower will fit together again as accurately as if they were respectively die and counter-die.

REFLEX DISTURBANCES AND THEIR RELATION TO MODERN DENTAL PRACTICE*

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INTRODUCTION

THE DENTAL PROFESSION has been busily engaged, during the past decade, in a study of focal infections. Previous to this time, there were hundreds of references to infections of this nature in the literature of the profession, before Dr. William Hunter's memorable indictment, but very little attention was paid to them. Since that time, the pendulum of rational thought and action in this connection has swung far out of its natural bounds and is only now beginning to recede toward a normal balance. Soon, a position between the marked conservatism of the past and the ridiculous radicalism of the last few years will be assumed in this regard, and the problems with reference to extraction of teeth, removal of plups and the bearing of areas of infection in the mouth on general health conditions will be to a large degree solved.

The time is now ripe for a serious consideration of a similar and just as important problem—the problem of reflex disturbances in their relation to dental practice. A perusal of the literature will reveal the fact that just as many, if not more references have been made in the past to disturbances of this nature, as have been made to focal infections. It has been stated that up to 1917 there had been over twelve hundred references to the subject in the *Dental Cosmos* alone, and yet very little impression had been made as to their importance. The probability is, that many more disturbances of a vague and often alarming nature arise from reflexes in or about the teeth than from oral focal infections. In many instances, conditions now attributed to infective processes undoubtedly will be found finally to be either pure reflexes, or a combination of septic and nervous disturbances.

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*One of a series of articles by Dental College Teachers, written for THE DENTAL SUMMARY.

A classical example of numerous attempts in past years to accentuate the close connection between the tissues of the mouth and distant parts is that of Dr. James W. White, in "*American System of Dentistry*," page 323, when he says:

"Anatomically considered, no other portion of the human organism offers such a complex association of tissues as those which compose the mouth; no other has such diversified physiological functions, and, from a pathological standpoint, no such significant systemic relations. Its various offices necessitate a no less varied organization and an equally-varied relation with other structures. The wide circle of its anatomical and physiological sympathies suggests an equal circle of pathological complications, and indicates the diversity as well as the gravity of the disturbances dependent upon systemic relations to which its lesions may give rise. By means of its lining mucous membrane, the mouth is related by continuity with the pharynx, œsophagus, stomach, and intestinal tract, the larynx, trachea, and bronchi, and by contiguity, as well as by continuity, with the eyes, ears, nares and antra. But it is to direct or sympathetic nervous relations that the most formidable disturbances are to be attributed. The terminal distribution in and about the mouth of the sensory and motor branches of the sensitive trigeminus, its extensive topographical connections and their relations to the heterogeneous tissues and manifold functions concerned, and its association with the great sympathetic, thus connecting the teeth with the entire organism, explain the liability to aberrations of sensation, nutrition and motion when its termini are the seat of disordered sensibility."

GENERAL STUDY OF THE NERVOUS SYSTEM

The nervous system consists of:

First, the brain and spinal cord (located in the skull and vertebral column).

Second, sympathetic ganglia, smaller masses of nervous matter in the abdominal and thoracic cavities, neck and head.

Third, cords of nerve fibers connecting the central nervous system with the periphery and sympathetic ganglia, and

Fourth, peripheral organs (end organs).

The functions of nerve fibers are to conduct impressions, just as the functions of arteries, veins and lymphatics are to conduct fluids. Through the nervous system many reflexes are produced. By *reflex action* is meant the transmission along a nerve of an impression to the central nervous system, and its reflection back along the course of another nerve to some other locality. For the manifestation of every reflex action four things are necessary, viz.,

First, one or more perfect afferent fibers to convey impressions.

Second, a nerve center for their reception and reflection.

Third, one or more efferent fibers along which the impression may be conducted to

Fourth, the muscular or other tissue by which the effect is manifested.

Quoting from Kirk, "Nerve fibers have been commonly classed as sensory or motor. This is not altogether accurate, and the terms centripetal or afferent, and centrifugal or efferent are more properly used, since the result of stimulating a nerve of the former kind is not always the production of pain or other form of sensation, nor is motion the invariable result of stimulating the latter.

"The term intercentral is applied to those nerve fibers which connect more or less distinct nerve centers and may, therefore, be said to have no peripheral distribution in the ordinary sense of the term.

"Impressions made upon the terminations or upon the trunk of a centripetal nerve may cause, (a) pain or some other kind of sensation; (b), special sensation; (c), reflex action of some kind, or (d), inhibition, or restraint of action. Similarly, impressions made upon a centrifugal nerve may cause (a), contraction of muscle, (motor nerve); (b), it may influence nutrition, (trophic nerve); (c), it may influence secretion, (secretory nerve); or (d), inhibit, augment, or stop any other efferent action.

"It is a law of action in all nerve fibers and corresponds with the continuity and simplicity of their course, that an impression made on any fiber is simply and uninterruptedly transmitted along it without itself being imparted or diffused to any of the fibers lying near it. It is possible that the mere passage of a nerve impulse along a nerve fiber, however, *may* produce some effect upon the neighboring nerve fibers. Their adaptation to the purpose of simple conduction is, perhaps, due to the contents of each fiber being completely isolated from those of adjacent fibers by the myelin sheath in which each is enclosed, which acts, it may be supposed, just as silk or other nonconductors of electricity do, which when covering a wire, prevent the electric condition of the wire from being conducted into the surrounding medium." These impressions are, however, sometimes shunted to other nerves owing to disease of the sheath.

Sterling says, "The change which a stimulus sets up in a nerve, with the exact nature of which we are unacquainted, appears to travel along a nerve fiber in both directions with considerable velocity in the form of a wave. Helmholtz and Baxt have estimated the average rate of conduction in human motor nerves at one hundred and eleven feet (nearly twenty-nine meters) per second. It probably is under rather than over the average velocity. Rutherford's observations agree with those of Von Wittich, that the rate of transmission in sensory nerves is about one hundred and forty feet (forty-two meters) per second. The velocity of the nerve impulse in motor nerves has been calculated by noticing the duration of the interval between two contractions of the same muscle when stimulated by means of two pairs of electrodes, one placed behind the nerve close to the muscle, and the second placed at a known distance further away from the muscle. The contraction ensues, when the stimulus is applied further from the muscle, later than in the other case, and the interval between the two contractions is occupied by the passage of the impulse down the nerve. With these data it is concluded the velocity of the passage of the nerve impulse in a frog's motor nerve is twenty-eight to thirty meters per second. In the human motor nerve, calculated by applying the stimulus through the skin instead of directly to the nerve, the velocity is greater, viz, about thirty-three to fifty meters per second. Various conditions modify the rate of transmission, of which temperature is one of the most important, a very low or a very high temperature diminishing it; fatigue of the nerve acting in the same direction, but increase of stimulus up to a certain point increasing it, as does also the catelectro-tonic condition of the nerve."

STUDY OF INDIVIDUAL NERVES

Those nerves which especially concern us in this discussion are the fifth, or trigeminal, and the seventh, or facial. The trigeminal nerve presents three divisions, viz.: ophthalmic, superior and inferior maxillary. According to MacMillan, "This is the great sensory nerve of the face, anterior part of the scalp, nasal fossæ, jaws, tongue and anterior part of the ear. The ophthalmic division divides into (1) the lachrymal, supplying the forehead and anterior part of the scalp; (2), the nasal, supplying the upper part of the nasal cavity. The superior maxillary division supplies the upper teeth, the lower eyelid, upper lip, side of the nose and through the temporo-malar, the tissues of the temporal fossæ. The inferior maxillary division supplies the lower teeth, side of the tongue, chin, lower lip and, through the auriculo-temporal, the tragus. The fifth nerve is a mixed nerve and sends motor branches to the muscles of mastication. You can see by this short description the intricate reflexes that may occur, due to its wonderful distribution and its exposed condition.

"Tracing back the motor division, it will be found to end in the chief motor nucleus in the upper part of the pons varolii. The sympathetic fibers come from the mesencephalic root, located anterior to the chief motor nucleus. The three sensory branches pass into the cranium and converge into the gasserian ganglion. From here the sensory tract passes into the substance of the brain and ends around the cells of the reception nucleus of the trigeminal nerve at the upper part of the substancia geletinosa rolandi. Here each neuron divides into ascending and descending roots. The axones of the reception nucleus are gathered in the median fillet and end around the anterior nucleus of the thalamus. From here the sensations are carried to the cortical areas through the internal capsule. The fifth nerve is in intimate connection with the third, fourth, sixth, seventh, ninth and tenth, with the result that irritation is likely to produce neurotic results in the brain, salivary glands, skin, lungs, larynx, intestines, muscles of the face and extremities. Some of these reactions may be explained through the fact that closely associated with it are four sympathetic ganglia, viz., the ophthalmic, Meckel's, the otic and submaxillary. The ganglia are in effect little brains, which serve to control many involuntary mechanisms of the body. The ciliary ganglion sends branches to the ciliary muscles, the cornea and the iris. This ganglion receives its sensory root from the nasal branch of the opthalmic nerve, its motor root from the oculo-motor and its sympathetic root from the cavernous plexus. The laws governing the relations of ganglia to their branches of communication never have been definitely solved, but clinical evidence demonstrates that prolonged irritation causes changes in the parts supplied by the ganglia."

The facial nerve supplies motor impulses to half the face and scalp, exclusive of the muscles elevating the eyelid, the ocular muscles, the muscles of the tongue and those of mastication; also to one of the muscles of the middle ear, as well as to the stylohyoid and the posterior belly of the digastric.

REFLEX NEUROSES CLASSIFIED

Reflex neuroses may be classified into:

(a). Sensory reflexes, manifesting themselves in the form of pain in distant parts, while pain may or may not be present at the point of irritation.

(b). Motor reflexes, manifesting themselves in the form of muscular excitation or sedation in parts distant to the cause.

(c). Nutritive or trophic reflexes—a form of reflex in which the trophic or vasomotor nerves are reflexly irritated so as to cause trophic or nutritive disturbances.

METHOD OF TRANSMISSION OF IMPULSES

The method of transmission of impulses is not well understood. Neither do we understand why one reflex may manifest itself in the form of corea, another as a sensory paralysis and another as an interference with the nutrition of the part. In this connection Albert P. Brubaker has the following to say:

"Any attempt to trace out specifically the mistaken routes of the nervous currents, the reasons of their deroutation, and the rationale of the disordered processes is in the present state of neurology either impossible or highly unsatisfactory. To help our minds we may crudely picture the central nervous system, and especially the medulla as a sort of intricate switchboard of a large telegraphic office, where are focalized myriad wires from all parts of the compass. When in normal action, the connections are such that a message from any peripheral point is shunted to its proper receiver, transferred to another wire or sent into other and higher offices. Subordinate ganglia and spinal centers may be looked upon as relay or local stations with limited authority or power, but which in extreme or important cases must refer to a more central authority. Now, most of the pathological instances gathered seem to be the results of a disordered state of affairs at the switchboard, viz., the medulla oblongata. As far as concerns any adequate comprehension of the mysterious workings of the medulla, either in health of disease, we are very much like an individual wholly ignorant of, and standing before, the switchboard of the unheard-of telegraphic machines.

"The questions involved are of the profoundest interest and importance, but are little understood even by best investigators. Volumes have been written concerning the theories of counter-irritation and reflex neuroses. We are not to add to the number. We shall only note that in attempting to locate the source of the trouble in such cases we must remember that either of two processes may be present; either the cerebral mechanism may be solely at fault, resulting in an error of judgment on the part of the patient because of the switching of a message to the wrong receiving center; or the reflective irritation, returning by a false route, does in fact superinduce either a reflected neurosis or such a lesion in the peripheral tissues that they become the certain source of inflammation and pain. Whether a specific case belongs to one or the other of these classes is a question for refined diagnosis.

"The practical lesson to be derived from it all is far more clear. Dentists must be on their guard against a number of sources of error in diagnosis and treatment that have heretofore been insufficiently recognized. These cases demand of the dentist a wider knowledge and a more general training than up to the present time have been considered necessary; they show how subtilely and how frequently a slight derangement of nervous function produces the most unexpected consequences in the most unexpected places; they illustrate the lesson that meets the general practitioner at every turn, that the body is a multitudinous variety of units bound together into an interdependence by a nervous system, whose easily induced derangements may create quick havoc in strange places and by unintelligible ways."

The comparison by Brubaker of the nervous system to a large telegraphic switchboard and connections is very apt, but does not scientifically explain the question before us. The whole matter is undoubtedly wrapped up in the secret and unknown explanation of the origin and transmission of physical force. We previously have brought out the close anatomical relations of the roots of the fifth with other cranial nerves, as well as their intimate relationships, established through the medium of the ganglia mentioned.

As is well known, reflex disturbances are exaggerated in hereditary defects of tissue, in neurotic, degenerative, or syphilitic taint, as well as in conditions of lowered vitality from unhygienic living, improper nutrition, faults of the dietary, metabolic disturbances, anemia, chlorosis and similar conditions. The extent of the reflex disturbances will be regulated largely by (1), the character of the irritant; (2), the condition of the transmitting apparatus and (3), the character of the tissues to which the response finally is conducted.

In an attempt at explaining the *modus operandi* of the transmission of impulses by nervous tissue Baker says, "It is a reasonable supposition that the laws of nerve force correspond to the same general laws as other forces. As no force ever is lost, but must, when it disappears, appear as some other mode of motion, so peripheral irritation continually travelling inward is either reflected over and outward by other routes to other organs, or is stored up in interrelated centers until morbid function results in them. In case it is reflected back, the continuous innervation of a structure superinduces in it some morbid process. If it is not reflected back, there result such disorders as headache, insanity, neuralgia, or those periodical discharges of nerve force which are termed epileptic."

Kirk endeavors to explain the matter in a somewhat similar manner when he says, "It may be supposed that an impulse passing to a nerve cell may produce such a change in its metabolism that a discharge of energy ensues. This discharge is in some way passed down an efferent nerve as a stimulus and effects some change, motor, secretory, or nutritive, at the peripheral extremity of the latter—the difference in effect depending on the kind of peripheral nerve termination."

Lauder Brunton explains the pathology of headache from pathological disturbances in the teeth by saying that irritation in the tooth is reflected by way of the cervical sympathetic ganglia, causing spasmodic contraction of the arteries in the brain through irregular stimulation of the vasomotor nerves. A spasmodic contraction of the peripheral end of the arteries occurs through stimulation of the constrictors, resulting in dilatation of the proximal portion, with resultant overfulness and pressure on surrounding sensory nerves.

Although no scientific explanation ever has been fully worked out as to the exact manner in which impulses are transmitted by way of the nervous system, it is interesting to note three theories which have been advanced us to the explanation in which impulses are transmitted by way of the dentinal fibrillæ to the nerves of the pulp from areas of hypersentitive dentin. According to Robertson it is accomplished through a longitudinal contraction of the fibril and odontoblastic cell, resulting in lateral expansion, with the production of pressure on adjacent terminal sensory nerve endings in the pulp, through which latter the impression is transmitted to the reception centers in the brain. No direct connection ever has been discovered between these terminal nerve endings and the odontoblast. However, in the last few years Howard Mummery claims to have discovered nervous tissue in the dentin, which would account for the transmission of sensation by that route, but his claims have been largely disputed, especially by Hopewell Smith and Leon Williams.

According to Gysi, the sensation is transmitted along the fibril in the form of a wave, due to incompressibility of the water of the cell (fibril and odontoblast). Landois and Sterling attribute the transmission of the impulse to molecular vibration in the fibrils and nerves. It will thus be seen that the above theories indicate that the transmission of impulses via the fibril and nerve tissue probably is due to either physical force or metabolic changes in the transmitting mechanism.

CLASSIFICATION OF DENTAL REFLEX DISTURBANCES

Those reflex disturbances immediately concerning the dentist may be classified into:

First, tooth disturbances the result of pathologic conditions in distant parts.

Second, reflex disturbances in distant parts originating in pathologic conditions of the teeth and supporting structures.

Of these, the latter are the more numerous and more frequently observed, although many dental disturbances are due to distant causes. In this connection A. P. Brubaker crudely but aptly says, "One may have toothache in the brain, the ear, the stomach, or the hip joint; or one may have headache, gastralgia, etc. in the teeth."

REFLEX DISTURBANCES IN THE TEETH AS A RESULT OF DISEASE IN DISTANT PARTS

These may be located in the teeth or indefinitely located about them. They may originate from the following sources:

First, from another tooth.

Second, from optic and nasal disorders.

Third, from visceral disturbances.

Fourth, from cerebral disease.

Fifth, from systemic disorders.

Sixth, from disease along the course of any part of the fifth nerve.

Seventh, from affections of the maxillary and other sinuses.

First, From Other Teeth. Reflexes from one tooth to another are of common occurrence and frequently characteristic of pulp disturbance, since the pulp is not supplied with the tactile sense. Particularly are they noted in the chronic constructive diseases of the pulp. Reflex disturbances manifesting themselves in the form of arterial hyperemia, inflammation, pulp nodulus, secondary dentin, hypercementosis and similar conditions may be the result of irritation in adjoining teeth. A pyorrhea pocket or alveolar abscess also may produce various neuralgias, as well as reflex vascular disturbances in distant teeth.

Second, Optic and Nasal Disorders. Reflex neuralgias in the teeth may result from nasal operations, catheterizations of the nasal duct, accidents to or operations on the eye, ulceration of the cornea and similar conditions.

Third, Visceral Disturbances. Reflexes in the teeth in the form of neuralgia and hyperemic conditions are frequently the result of constipation, dyspepsia, sea-sickness, hunger, distended bladder, pregnancy, and uterine disturbance.

Fourth, Cerebral Disease. Embolism or thrombus in the brain, tumors, inflammation or softening of the brain, hysteria, insanity and other conditions of similar nature, may result in the production of reflex disturbances in or about the teeth.

Fifth, Systemic Disorders. Gout and arthritis may be mentioned as causative agents. Malaria often results in periodic attacks of neuralgia or inflammatory disturbance about the teeth. Syphilis frequently produces reflex disturbance of a pericemental nature. The exanthematous diseases (measles, chickenpox, scarlatina, etc.), may also be mentioned as causative of these conditions. Anemia, coryza, (common cold) and influenza, also produce reflexes in the pulp and pericementum.

Sixth, Disease along the Course of the Fifth Nerve. Dental reflexes often result from inflammation of the nerve trunk, neuritis, pressure of tumors on the nerve, fracture of the maxilla or mandible, fracture cicatrices and bone whorls.

Seventh, Affections of the Maxillary and Other Sinuses. Inflammation, infection, or abscess of the maxillary and frontal sinuses are familar examples of conditions producing reflex disturbances in the teeth.

REFLEX DISTURBANCES IN DISTANT PARTS RESULTING FROM PATHOLOGICAL DISTURBANCES ABOUT THE TEETH

The character of the tooth disturbance producing the reflex is interesting and often important in making a diagnosis. The pathological disturbances about the teeth producing these conditions may be mentioned as:

First, diseases of the pulp.
Second, diseases of the pericementum.
Third, dentition.
Fourth, impacted teeth.
Fifth, crowded arches.

First, Pulp Diseases. Chronic constructive diseases, viz., hypersensitive dentin, tubular calcification, secondary dentin, pulp nodules and calcific degeneration are more frequently concerned as causative factors. Acute destructive diseases, viz., arterial hyperemia, venus hyperemia, inflammation and suppuration are less frequently, though quite often, concerned.

Second, Pericemental Disturbance, viz., pericementitis, deposits on the roots, hypercementosis, resorption of roots, malocclusions, all result in pressure on and irritation of the nerves of the pericementum, and reflexes frequently result.

Third, Dentition. The pressure element is largely concerned here, owing to lack of harmony between gum absorption and pressure of blood supply at the root end, resulting in irritation in the gums, pulp or pericementum of the erupting tooth. It must be remembered that at five years of age fifty-two teeth are in process of development and absorption and that reflexes are natural under these circumstances. In the infant the spinal nervous system is more highly developed than the brain, consequently inhibitive nervous control is subordinate to spinal activities, and there are likely to be more intense manifestations in the infant than in the adult. Dr. Charles W. White says, "Dentition is an anatomical and physiological crisis of infancy, analogous to the other developmental crises of puberty and the menopause."

Fourth, Impacted Teeth. Here also pressure is largely concerned, producing resorptions, hypercementosis, pulp and pericemental disturbance in adjoining teeth, as well as reflexes in distant parts.

Fifth, Crowded Arches and Orthodontic Procedures. The pressure of crowded teeth and contracted arches, too rapid movements of the teeth, improper fixation and insufficient anchorages, are likely to result in pulp and pericemental disturbance, leading to distant reflex manifestations.

The character of the disturbance produced may be either in the form of:

First, sensory reflexes, viz., neuralgia, sensory paralysis, (anesthesia, from tiring of nerves, nerve fatigue).

Second, motor reflexes, viz., increased or diminished excitability of muscular tissues, resulting in contractions or paralysis of groups of muscles, or

Third, trophic or nutritive reflexes resulting in various nutritive disturbances.

Thousands of cases of reflex neuroses have been reported by Burchard, White, Brubaker, Salter, Hollender, Pickerill, Coleman, Wedel, Garretson, Lauder Brunton, Smale, Tomes, Newell, Jacoby, Brown, Marshall, Blair and others. As previously mentioned, there have been many more cases of this nature reported than disturbances from focal infection. Dr. Henry S. Upson, of Cleveland, whose researches in this connection were incomplete at his death, described many cases in his book "*Insomnia and Nerve Strain.*"

CHARACTERISTIC REFLEX NEUROSES FROM TOOTH DISTURBANCE

As previously brought out, the central origin of the fifth nerve is closely associated anatomically with those of the third, fourth, sixth, seventh, ninth and tenth nerves, which readily accounts for the vague and distant manifestations produced. As a result the following reflex neurotic conditions are seen which may be mentioned and classified as follows:

First, disturbances of the eyes.

Second, disturbances of the ears.

Third, muscular disorders.

Fourth, visceral disorders.

Fifth, trophic and vasomotor disturbances.

Sixth, affections of the nerves, (neuralgias, tic, paralysis).

Seventh, affections of the brain centers.

First, Disturbances of the Eyes. Functional disturbances predominate. Vasomotor disturbances are in the minority. The eyes frequently are affected with one or the other of the following conditions, viz., Strabismus, ptosis, paresis of the orbicularis, spasm of the ciliary, monocular diplopia, paresis of the rectus, partial paralysis of the third nerve, lagophthalmus, copious lacrimation, neuralgia of the eyeball, sclerotitis, conjunctivitis, keratitis, mydriasis, loss of accommodation, glaucoma, amblyopia, and exophthalmos.

Second, Disturbances of the Ears. Such conditions as otorrhea, catarrhal and purulent inflammation of the middle ear, otalgia, tinnitus aurium, deafness and reflex pains in the ears, are common.

Third, Muscular Disorders. Among these may be mentioned facial spasms affecting the facial group of muscles (these may be tonic or clonic), chorea, trismus, and torticollis. The fifth and seventh nerves are, as previously mentioned, very closely connected, in their manifestations.

Fourth, Visceral Disorders, such as obstinate vomiting, laryngeal cough, (reflex from teething), aphonia, hiccough, cardiac palpitations, uterine neuralgias.

Fifth, Tropic and Vasomotor Disturbances. The existence of a tropic center and tropic nerves is still under dispute. However, among the disturbances of this nature may be mentioned ulceration of the cornea, herpes, (fever blisters), papular and vesicular eruptions on the body and limbs during dentition.

Sixth, Affections of the Nerves. (Neuralgias, facial tic, tic douloureux and paralysis).

(*a*). Neuralgias. Among these may be mentioned neuralgias of the face, scalp, eyes, ears, neck, chest, arm, heart, ovarian and uterine neuralgias, and sciatica. It is well to note at this point that the majority of reflex neuralgias arising from the teeth are usually located in some part of the nerve branch supplying the source of irritation. However, they may be and occasionally are reflected to distant parts; *first,* either to other branches of the cranial nerve, or *second,* to other and adjacent nerves. Pain in the upper teeth usually is reflected to the parts supplied by the superior maxillary division of the fifth nerve; pain in the lower teeth, to the inferior maxillary distribution; while pain in either upper or lower may be referred to the ophthalmic division and the parts supplied by it. Pain referred to the opposite side of the face to that in which the cause is located is extremely rare. The acuteness of the reflex pain has no apparent relation to the extent of the irritation producing it. A small area of exposed dentin on the distal surface of a lower third molar, located near the gingival line may be the cause of intractable neuralgia. The acuteness of the pain may be governed to quite a degree by the degree of sensitivity inherent in the protoplasm of the affected tissues, and is most common and pronounced in those whose nervous irritability is exalted, viz., in those individuals classed as neuralgics.

(*b*). Facial Tic. A discussion of neuralgias would be incomplete without mention of tic. Facial tic, or intense neuralgia of the seventh nerve, is mostly located in the zygomatic and orbicularis palpebrarum muscles of one side. It may spread to other groups and affect the tongue, neck, shoulder and arm. It may frequently be considered a true reflex.

(*c*). Tic Douloureux (Trousseau). A convulsive, chronic, intense neuralgia of the fifth nerve, sometimes known as major tic, is very intractable and frequently due to chronic irritation of the trigeminous from tooth reflexes.

(*d*). Paralyses in the form of facial paralysis, paralysis of the arm, hemiplegia, paraplegia, general paralysis and infantile paralysis are all mentioned by various authorities as resulting from tooth disturbance.

Seventh, Affections of the Brain Centers. Convulsions (clonic and tonic), headache, hysteria, corea, mental backwardness, imbecility, dementia precox, epilepsy, and insanity (maniacal and melancholic) all may occasionally be resultant of reflexes about the teeth.

CONCLUSION

No attempt has been made to present anything of an original nature in this paper. It must be looked upon as merely a partial review of the subject, as contained in the literature of the profession. Neither must it be supposed that an attempt has been made to attribute most of the ills to which the human race is subject to reflex disturbances from the teeth. Many of the marked conditions mentioned may arise from other causes and frequently do, but it must be accepted as a fact that they are frequently of a reflex dental nature. Many of those mentioned do often arise as a result of infection and many of them are caused by a combination of septic and nervous factors. However, just as many or even more, are undoubtedly true reflexes. No mention has been made of the disorders of the ductless glands, and the systemic conditions arising from them. Many of these are often of a reflex nature, but space will not admit of their discussion here.

The evidence is now before us. What is the dental profession going to do about it? Is it not high time that a serious consideration of the matter be inaugurated in order that new light may be thrown on it and great good be accomplished? The subject is of the utmost importance to the general practitioner of dentistry or medicine, to the dental or medical specialist, as well as to the public whom these professions serve.

2165 Adelbert Road.

PRESIDENT'S ADDRESS*

BY DR. HARRY C. CARR, INDIANAPOLIS

TO THE officers and members, ladies and gentlemen: It is with a sincere feeling of pleasure and appreciation that I greet you this afternoon, at the opening of the sixty-second annual convention of the Indiana State Dental Association.

The great world war has been fought and won and hostilities finally have ceased. Our boys who so gallantly answered the call of our country have returned home, and again taken their places in the family, the business and professional life of the community. At this point we pause for a moment to remember those noble fellows who went over there but failed to return, and to whose memory we pay our deep and silent respect.

It is with a feeling of great pride that we reflect on the fine record made by the dental profession of this State in all of the various activities of the war, but specially are we proud of the records made by the members of our profession in the discharge of their duties as relates directly to the relief of and restoring to normal, the boys of the army who were so unfortunate as to be so terribly mangled by face and jaw wounds.

You are all familiar with the triumphs of dental surgery in the war, but I just mention it in passing, that you may again be reminded and impressed with the fact, that this is the first time that our profession has had the opportunity to prove its worth in time of war since the birth of the profession. On its first trial it has proven itself of great value and indispensable as a medical aid.

With the ending of the war comes the reconstruction period; this does not alone mean the commercial and social interests of our country, but includes also the professions as well, and our own in particular.

The men who have been over there have returned home with new and broader ideas of life and of dentistry. They are not content to start in again where they left off, and practice dental mechanics in a more or less indifferent manner. They remember the reports of the examinations of hundreds of thousands of mouths in which were shown the shocking results of neglect and lack of attention and of bad dentistry, and this in spite of the fact that our army showed better mouth conditions than any other army in the world. Even in the mouths of those who thought they had given their mouths careful attention, and had been in the hands of their dentist many times, we find ofttimes, worse conditions than those caused by neglect, and the health in greater danger.

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*Read before the Indiana State Dental Association, Sixty-second Annual Meeting, 1920.

Now what does this mean to us as individuals and as an organization?

It means that we must enter the publicity field and help spread the gospel of mouth hygiene, and the philosophy that "a clean tooth does not decay." We must educate ourselves to be more proficient, and produce dental operations that will not have a "flare back" and cause a serious breakdown in the health of our patients.

Let us forget for a while the construction of bridges (both fixed and removable), and the setting of crowns and inlays, and devote an equal amount of time and energy to instructing our clientele that it is just as necessary to keep the teeth clean as it is our bodies. We are too prone to see the place where a bridge or a crown is needed and overlook the fact that the patient's gums are sore and bleeding, and that the teeth are encrusted with tartar. It is not pleasant to scale and polish the teeth, we know, and then besides, in the hands of the average dentist the making of crowns and bridges is so much more remunerative.

With this indifference displayed on the part of the dentist, toward the unclean and unhealthy condition of the human mouth, is it strange that the public also is careless and uninformed?

As an organization we must take steps to create a sinking fund, looking forward to a time when we will have money enough to cover the State with suitable publicity through the press, and to hold public meetings where we can have men tell the public in an interesting and forceful manner the imperative need of keeping the mouth free from filth and septic dentistry.

I recommend that a committee be appointed to make plans and present at this meeting, with the idea in view of establishing such a fund at once.

In years gone by the dental profession has been accused of being composed of men who were not of a studious nature; that they were mechanics rather than students. Looking back over the years passed we can see that the accusation was to some extent just, for barring a few men here and there in the profession, who had had the opportunity of receiving a finished academic education, or had some natural ability as original research workers, the ranks of our profession were recruited from the farm, the barber-shop, the mill, the factory, the store and elsewhere; men with a limited education but with a mechanical turn of mind and an ambition. Our dental colleges of the earlier days were crude and without a very strict standard of admittance, compared with the standard of today. The result was, men were graduated as dental mechanics. Times have changed, and the men who were graduated years ago are realizing that they must make up, in some way, for the lack of opportunity in their youth, and in order to keep abreast with the young men who are being graduated from our now modern and up-to-the-minute colleges, with a four years' course, and higher entrance requirements, they are reading their journals, attending their society meetings and taking post-graduate courses. It is to this last (the post-graduate course) that I wish to draw your attention. There is a tendency on the part of a number of itinerant post-graduate teachers to capitalize this desire on the part of the dentist to study and learn, by going from place to place and getting up classes at an excessive fee for very little effort expended or knowledge imparted, thereby imposing on the dentist and perhaps discouraging him from further attempts at post-graduate study. It is the opinion of the writer that these post-graduate classes should be given under the auspices of our dental colleges or our regularly-organized dental societies. In this way these recognized bodies can protect, advise, and instruct the dentist who has a desire to increase his knowledge in any branch of dentistry.

I therefore recommend that this association pass a resolution and go on record as discouraging this practice of the itinerant educator, and encouraging the colleges and societies to take over this class of education. For instance, here in Indianapolis, the Indianapolis Dental Society, a component of the State Association, has given over to the *ad interim* committee, which as you all know is a standing committee provided for by the constitituon and by-laws of this association, the management of the affairs of the society. One of the duties of this committee is to look up the record and ability of any one wishing to give a post-graduate course in this community. Unless the post-graduate teacher has the recommendation of this committee, neither the society nor the Indiana Dental College will permit an itinerant teacher to conduct a class under their auspices. Nor will the members subscribe to a class of this kind until this committee has endorsed him. The writer thinks this a very able arrangement and urges all of the other components to do likewise.

It will have a great tendency to discourage all unscrupulous and designing men in establishing these post-graduate classes, and protect members of this association from being imposed upon by these men.

For many years past it has been the practice of the trustees of this association to appoint at their last meeting of each session the various committees to assist in conducting the meeting of the following year, and then leave these committees, and specially the executive committeeman, uninstructed as to the plan of the meeting and the amount of money to be expended on the meeting of the following year, until the trustees meet in the fall, usually at the time of the convention of the Northern Indiana Association. At this time a part of the board of trustees (for not all of the board attend this meeting) decide what shall be the program for next year and how much money shall be expended, and the executive committeeman is so instructed.

It is the opinion of your president that this is a poor plan, inasmuch as it leaves your executive committeeman (ofttimes a new man, in the preparation of a program), with no instructions for from four to five months of the year. It causes a loss of valuable time which might be profitably employed in looking up essayists and engaging them before they are picked over and booked by other societies. Therefore it is recommended that the trustees be instructed to formulate plans for the ensuing year before they adjourn at each present session, outlining the type of program for the next year and voting the necessary funds to be expended on the meeting and so instructing the executive committeeman. This will enable him to go to work immediately on his program, giving him an opportunity to pick his talent from the best before they are engaged elsewhere.

The complaint often has been made that the programs do not represent always the subjects that the general membership desire, and why? Your executive committeeman is appointed by your board of trustees at the last meeting of the board each year; he is told that his duty is to prepare a program for the next year and have charge of same. This executive committeeman may not have had any previous experience in preparing programs, yet he is turned loose on an uncharted sea without compass or other sailing instruments; he has only a very vague idea of what is expected of him and scarcely any instructions as to what kind of a program to present and no intimation of what the members of the association wish to hear. Do you wonder that he sometimes makes mistakes and presents subjects that are not always to your liking? The writer would recommend that each year the secretary be instructed to have printed a ballot, on which are enumerated two or more types of meetings (such as papers and discussions, as we have this year, or the post-graduate classes or in other words, the Oklahoma plan), etc., clinics—table or progressive, together with a list of the various topics that are of interest to the profession and anything else that might be of value to the officers in outlining the program; these ballots to be passed out at one of the sessions of the association with instructions to the members to indicate thereon type of meeting desired, and kind of clinics also, checking off any three of the subjects listed. These ballots to be collected and the indications listed. With this data before them, your officers can at least serve up a program that the majority of the members will enjoy.

There is still some unorganized territory in the State and I would urge the organization of a component societies committee, to work diligently until all of this territory is either enrolled under a component of its own, or is attached to some component that already is organized.

What I am about to propose now will entail considerable work and some hardship on one of your officers, and make some expense to our organization, but the writer believes it will be the means of joining the component societies more closely to the parent body. As our organization now stands, the State Association is in touch with the component societies through its secretary by correspondence only. It seems to your president that the relations of the State Association and its components could be made closer and more enduring if some personal touch of the State could be given the component at time of the meeting of the component. As each of the components usually has but one meeting a year, it seems to the writer to be entirely practicable to have the president of this association, each year visit at the meeting of each component society, and appear on the program with a short talk, telling of the progress of the association and its program for next year, endeavoring to develop enthusiasm for and a desire to attend the next annual meeting. Where the president finds it impossible to attend a meeting let him send an accredited representative who will respond in his stead. The traveling expenses to be paid out of the funds in the state treasury.

The writer feels that this suggestion should be discussed at this meeting and if it meets with the approval of the membership some action should be taken looking to its adoption.

For several years past there has been what we were pleased to term a "membership cup contest." This contest will not be held this year and for this reason: the prize cup has been won by one component three times in succession and now remains permanently in its possession. The officers did not feel justified in purchasing another cup for a similar contest especially under the rules of the previous contests, as they were manifestly unfair to some of the contenders. However, it seems to the writer that it is necessary to have a contest of some sort each year to stimulate attendance, payment of dues, etc. Therefore your president recommends that a committee be appointed to draft a plan for a contest, the rules of which will give all parties a fair chance at the prize, and that authority be given this committee to purchase a suitable prize.

I would be indeed, indifferent to my associates, if I did not at this time express publicly my appreciation of the loyal cooperation given by those on whose shoulders the burden of the preparation for this meeting has fallen. I desire to mention particularly the work of Dr. Chas. R. Jackson, executive committeeman, Dr. Earl Brooks, supervisor of clinics, and Dr. O. W. Van Kirk, master of exhibits.

These men have given bountifully of their time and energy, to the work of preparing a program that will be of benefit and pleasure to us all.

In closing, I wish to thank the membership for the honor you have conferred on me in electing me to this high office, and to express my deep sense of gratitude in being permitted to serve as the presiding officer of such an honorable and scientific body as the Indiana State Dental Association, at its sixty-second annual convention. May I serve you with fairness and impartiality. I thank you.

AMALGAM—WHY?*

BY W. C. HESSLER, D.D.S., CRAWFORDSVILLE, INDIANA

OFFICERS, members and friends of the Indiana State Dental Society:

Simplicity and simple statements soon said, in short, smooth sentences, serve satisfactorily to screen the story.

How complicated the simplest thing can be made, and the value of simplicity and brevity of statement is illustrated by the story of an engineer who said to a company: "This morning I went over to see a new machine we have at our place, and it is astonishing how it works."

"And how *does* it work?" asked one. "Well," was the reply, "by means of a pedal attachment a fulcrumed lever converts a vertical reciprocating motion into a circular movement. The principal part of the machine is a huge disk that revolves in a vertical plane. Power is applied through the axis of the disk and work is done on the periphery; and the hardest steel by mere impact may be reduced to any shape."

"What *is* this wonderful machine?" was asked.

"A grindstone."

It takes much courage to appear before a body of men and women of whom at least a few have kept in touch with the latest bacteriological findings, both benign and malignant.

It is most discouraging to know, to think, or even to suspect that the most expert and skillful operator who has made what he thinks is a reasonably good repair of a carious tooth, has simply sealed up some pathogenic organism which may cause the early decline, and finally the death of his patient.

If the operator has observed aseptic precautions with the rubber dam, sterile hands and instruments, and if he has sterilized the tooth cavity, Mr. Pathogen is not going to be excluded, but gains his entrance into the tooth pulp by tunneling through the lymphatics and into the apical foramen to the tooth pulp where he becomes the progenitor of many generations of his kind.

In discussing amalgam as a "tooth saver" and a medium for restoring the carious tooth to a masticating organ, let us grant that the various formulæ of alloy have been brought to a reasonable state of reliability. The choice of alloy whether fast or slow setting, and the manner of mixing with mercury or amalgamation is a matter of individual preference.

After having decided to make a restoration or fill a tooth with amalgam, the most important step is cavity preparation.

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*Read before the Indiana State Dental Society, May, 1920.

All frail enamel walls should be cut away, carefully trimmed smooth and straight lines should be maintained, if possible.

The carious dentin should be removed.

The enamel margins should be beveled so there are no unsupported enamel rods.

If the cavity is not of a retentive form it should be made so by making shallow grooves in opposing walls of dentin.

Be sure to heed Dr. C. N. Johnson's instruction, that of practicing "extension for prevention."

When the cavity is thoroughly prepared we are ready for the insertion of the filling.

Maintain a dry cavity in the tooth while inserting the filling.

Adjust the rubber dam when and where it is applicable.

Use a matrix for compound cavities; this helps to avoid overhanging margins.

A cavity lining is advisable at any and all times. This prevents, or at least minimizes thermal or galvanic shock.

Small pieces of the wafer or button of freshly-mixed amalgam should be placed in the cavity.

Then with a ball burnisher, the amalgam should be burnished against the walls and the margins of the cavity.

This technic may be followed during the insertion of the entire filling.

It is to be granted that the operator using amalgam should know the working properties of the alloy of his choice.

In deep interproximal or buccal cavities, those cavities which extend below the gingival margin, cavities where it is impossible to apply the rubber dam, amalgam is protecting more teeth against recurrence of decay than any other filling material.

We would urge the gold foil and the gold inlay enthusiast to use amalgam to build up and to protect the cervical wall and margin of cavities extending below the gingival line. In most cases these cavities can be kept dry with cotton rolls or small napkins for sufficient interval of time to insert an amalgam filling.

There are badly-decayed molars and some bicuspids which have been built up and restored with amalgam, giving more and better service than if they had been restored with a gold shell crown.

Amalgam can be inserted where other filling materials cannot be successfully used or applied, and we still believe in the antiseptic, germicidal and caries-resisting power of the tin compounds on the surfaces and margins of amalgam fillings.

For saving temporary and permanent molars for children, amalgam is the most desirable material in the hands of many dentists. If amalgam can be inserted with greater comfort to the patient and also to the operator, and if the tooth can be restored to usefulness and to function for the same or a greater length of time than with any other filling material, then amalgam should be the choice, and the operator should be remunerated for the time and energy expended.

It should be the effort and desire of every dentist to be employed to render efficient services, and he then should be justly and equitably paid for services rendered.

The patients who apply to the dentist for services should be kindly, yet firmly informed, that the dentist is not selling fillings but that he is selling services.

If you can save, restore, or fill the cavity in a carious tooth better with amalgam than with any other filling material—then use amalgam.

DISCUSSION

Dr. Chas. A. Priest, Marion: Before starting to discuss this paper I want to thank the writer for presenting such a carefully-prepared paper, and also to publicly apologize to him for not telling him before.

Other subjects have been brought before the dental profession so much in the last few years, that it has caused one to wonder if some of the older subjects had not been forgotten entirely. And from the appearance of some of the amalgam fillings (or rather plugs) that you find in the mouths of some patients, one is convinced that the subject of amalgam is not only forgotten but it is also rotten in the hands of—well, those operators that you do not often see at a dental convention.

We have looked at and studied other subjects so much that we have become prejudiced and we often are unable to see the good in the truly good. It recalls to mind the story of the man that said he was not going to support either Wood or Johnson for he said it was nothing but a wet and dry campaign between them anyhow. Why, he said, "Wood goes around killing people with his wood alcohol." And "Johnson, why isn't he that 'pussy foot' Johnson that went around all over England preaching prohibition until he got one eye knocked out, and now he wants to be president of the United States?"

And that is about the situation in regard to amalgam. If we throw away our prejudices in regard to amalgam we will then learn to know what we are talking of and can begin to see the real virtue in the most-used and also most-abused of all restoration materials.

The essayist makes the statement, "that the most important step is in cavity preparation" which might be true in amalgam restoration, in the hands of some operators, but it is not the first nor is it the last thing to be considered in tooth restoration, whether restored with amalgam or some other material.

The first thing to be considered is, "why does the tooth decay or need a restoration? What conditions were present that caused that particular tooth to decay?" After this question has been answered to your own satisfaction you are then ready to correct the condition, but you can only correct it by always keeping in mind the cause. You can then prepare the cavity in a way that will best retain the particular restoration that is needed to correct the existing condition.

I cannot just agree with the essayist when he makes the statement that the most important part is "cavity preparation." I will grant that the cavity preparation is a very important part. And I can hardly conceive of any dentist, living in a Christian nation, who is so dishonest to himself and to his patients that he would not prepare the cavity in the best possible way to retain the restoration and prolong the life of the tooth and patient. I am reminded of the poem:

"Nothing useless is or low:
Each thing in its place is best.
And what seems but idle show
Strengthens and supports the rest."

In amalgam restoration I would like to put particular emphasis upon each individual detail, for each helps to make perfect the finished product.

The essayist says we have our many different ways in mixing or amalgamating an alloy, and I feel that is one of our mistakes. So often we do just what we say we are going to do, "mix up our amalgam." Why not get in the habit of saying, "we are going to amalgamate the alloy" and then proceed to do just what we say we are going to do;

There is a great deal of difference between an alloy that is "mixed" and one that is amalgamated, and to show the difference I have here a sample showing how poorly a mixed alloy will seal a cavity.

And how much better an amalgamated alloy will seal the cavity. There was nothing said by the essayist in regard to the amount of mercury to be used. And in this I would like to caution you that there is a correct amount to use with your alloy and if you vary from that amount you will have a faulty filling when finished.

According to Black, if too much mercury is used with an expanding alloy it increases the expansion of that alloy. And if too much mercury is used with a contracting alloy it increases the amount of contraction of that alloy. So the only true way to make an amalgam is to use the amount of mercury the manufacturer of the alloy has found by experiment to be correct for that particular alloy.

The essayist has told us that an oval instrument is best. I have watched contractors constructing concrete work and always have noticed that they use flat-ended tamps to tamp the concrete. I also have noticed that flat-ended tamps were used by the men in tamping the soil that is being placed back in the sewer after the pipes have been placed, and I have wondered if those contractors have not found that their work was made more solid by using flat-ended tamps. And this led me to make an following experiment which shows that the filling that was placed with the flat-ended instrument has sealed the cavity much more securely than the one placed with the oval instrument.

It is the observing of those little things that puts the "why" into amalgam. "Why amalgam?" "Why anything," if we do not observe the little things.

Oh, if we all could dig up that little old McGuffey's third reader and read and re-read that "observing little things." Don't you remember how the great sculptor was showing a person a fine piece of sculpture work he had been producing and the person made the remark that he had seen it before. But said the sculptor, "Don't you observe that I have taken off a little here and brought out that feature there?" And the man made the remark that those were just "little things, just mere trifles" to which the great sculptor answered, "But it is those little things that make perfection, and perfection is no mere trifle."

Still keeping in mind the cause of our needed restoration, we build and finish the restoration in a way that will correct the cause, and in doing this you then become that great sculptor that observes little things, and by taking off a little here and adding a little there until you have so shaped and fashioned your finished product that you have perfection, you have attained "no mere trifle."

Dr. Hessler (closing): I thank Dr. Priest for adding to the instructions that might be found in such a paper as this, and I am glad he has gone into detail in the manipulation and inserting of the filling.

As to the contention between the oval-end and square-end instruments, inasmuch as the amalgam is real plastic, I feel I can make a thoroughly seated or anchored filling, even where the retention is questionable, because by rubbing or burnishing in the amalgam, you can bring the mercury to the surface with the oval as well as with the square-ended instrument, and I believe the result will prove as good.

Each man should use what is best in his hands. Our effort should be to make a better filling than we made yesterday or an hour ago. Improve your technic, and seek improvement in results.

Ambition

MAN was made for growth. It is the object, the explanation, of his being. To have an ambition to grow larger and broader every day, to push the horizon of ignorance a little further away, to become a little richer in knowledge, a little wiser, and more of a man—that is ambition worth while.—*Marden*

FUNDAMENTALS OF OPERATIVE DENTISTRY[*]

BY W. H. O. McGEHEE, M.D.,D.D.S., CLEVELAND, OHIO

PROFESSOR OF OPERATIVE DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND SUPERINTENDENT OF CLINICS IN THE DENTAL SCHOOL OF WESTERN RESERVE UNIVERSITY.

EXAMINATION OF THE PATIENT

THE EXAMINATION of the patient is a much more important procedure than is frequently made of it by many operators. It should be very carefully conducted, and should include, not only a close inspection of the teeth and supporting structures, but also, on account of its intimate bearing on questions of diagnosis, a general inspection of the patient, noting such details as physical appearance, general health, manner of speech and similar conditions. It also affords an opportunity to become acquainted with new patients, to establish cordial, though business-like relationships, to diplomatically obtain information as to financial standing, and to discuss the matter of fees.

In making the examination, the minutest defects and most obscure pathological disturbances should be detected and recorded, in order that these may receive immediate attention. It is a great mistake to defer to a later date operations on minor disturbances. They can be remedied in their inception with much less pain to the patient and trouble to the operator, and will enable the patient to maintain more readily proper hygienic conditions in the mouth. The methods of procedure are fully described in the following pages.

122. On conducting a thorough examination of the mouth, what *Conditions are Essential?*

First, cleanliness.
Second, dryness.
Third, separation.

123. How may these *Conditions be Accomplished?*

First, in many cases the *prophylactic operation* should precede the examination, which will accomplish the first essential.

Second, *dryness* may be obtained by the use of absorbents, the chip blower, the saliva ejector, or the application of alcohol and hot air.

Third, *separation* is produced by the *careful* use of the rapid separator.

124. Why is a *Thorough and Careful Examination* necessary?

In order that the minutest defects, or most obscure pathological conditions may be detected early, and be more easily

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(*Continued from page 513, June SUMMARY).

and quickly remedied, so that the mouth may be maintained, as nearly as possible, in a strictly hygienic condition.

125. Describe the correct *Position of the Operator* for examining and operating on the teeth.

First, he should, as far as conditions will allow, stand in an upright position, with his shoulders thrown back and his chest forward, to avoid the tendency to stoop-shoulders.

Second, the weight of his body should rest firmly on the balls of his feet, rather than on his heels.

Third, the points of bodily contact with the patient should be as few as possible; as a rule only those secured by the correct application of the *rest* and *guard.*

Fourth, he should breathe deeply, slowly and naturally, through the nose, avoiding inhaling the patient's breath, or exhaling into his face.

126. Describe the correct *Position of the Chair* for examining or operating on the teeth.

First, for the upper teeth the chair should be tilted more or less backward (in order that a better view may be obtained),and elevated to a greater or less extent (depending on whether the anterior or posterior teeth are concerned), to suit the convenience of the operator.

Second, for the lower teeth the patient should be in the upright position, so that the light may be thrown directly onto their surfaces, with the chair lowered.

127. What *Instruments and Appliances* are used for making the examination?

Explorers, mouth mirrors (plane and concave), (*Fig. 65*) floss silk, magnifying glasses (hand or jeweler's eye glasses), chip blower, absorbents and electric mouth lamps (stomatoscopes).

128. *How often* should examinations be made?

As a general rule, children should be examined at intervals of about three months, while adults should receive attention at least twice a year.

129. What *Regions or Localities* require specially close inspection?

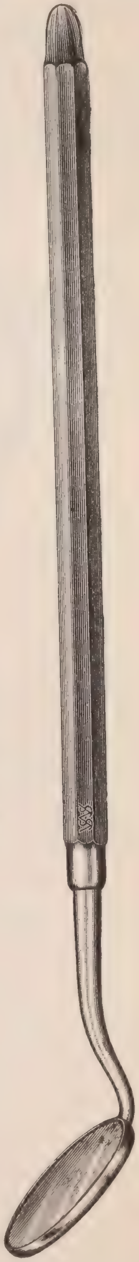


Fig. 65
Mouth Mirror

First, lines of union of enamel plates, such as pits and fissures on occlusal, buccal and lingual surfaces.

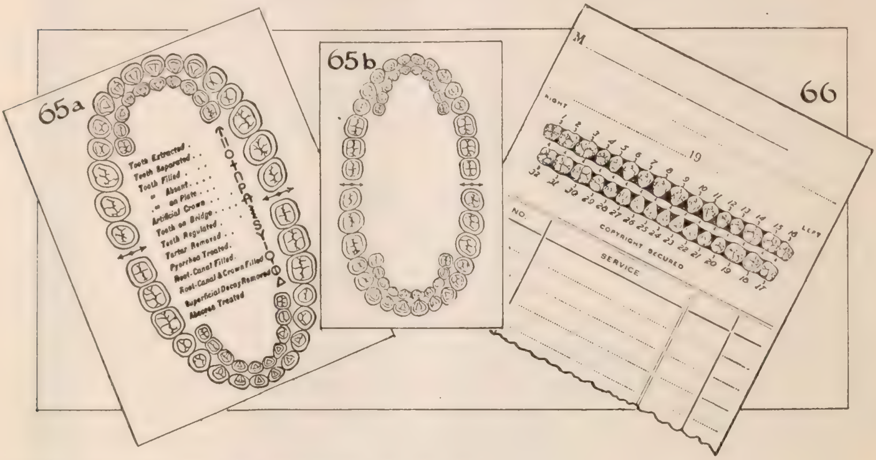
Second, the *gingival region,* at and beneath the gum margin.

Third, proximal surfaces, especially near and gingivally to the contact point, where decay most frequently begins on these surfaces.

Fourth, margins of fillings, inlays and crowns.

130. Describe the method of using and mention the advantages of *Chart Records.*

First, method of using.



Figs. 65a, 65b and 66—Examination charts.

During the examination, as each defect is found, its location and character, as well as the probable treatment indicated, is marked on a record containing a chart of the permanent and deciduous teeth (*Figs. 65a, 65b and 66*). The charts illustrated are similar to those in general use. Many others may be readily obtained, some of which are quite complicated and admit of more explicit detail in recording pathological conditions. In locations where trouble is suspected, but not positively diagnosed, a question mark is placed as a reminder, when at the end of the examination a more thorough search may be made in those regions.

Second, advantages.

A The extent and location of the conditions requiring attention may be readily and easily explained to the patient and, if advisable or necessary, discussion of fees facilitated.

B The chart may be frequently referred to by the operator, serving as a quick guide in the location of the required operation at each sitting.

131. Describe the routine *Method of Making an Examination.*

Various authorities recommend different methods. All agree that a definite and systematic course of procedure should be adopted and regularly followed. The author, who examines many patients in a large clinic, recommends the following, viz.:

First, general physical inspection. Note the carriage, general bearing and physical appearance, complexion, color of lips, hair, nails and eyes; general health; condition of pulse if desirable; manner of speech; inquire for presence or absence of pain.

Second, examination of the soft tissues of the mouth. Note the color and condition of the mucous membrane of lips, cheeks and gums; presence or absence of swellings, tenderness or abscess tracts; general hygienic condition, as far as deposits are concerned; condition of tongue, whether coated or furred. The X-ray is a valuable adjunct in later detecting and diagnosing obscure conditions.

Third, lower teeth. Start at the third molar on the *left* side and examine the buccal, occlusal and lingual surfaces, in the order mentioned, of each tooth separately, coming forward to the median line. Repeat the procedure on the *right* side. Then examine the approximal surfaces in the same order.

Fourth, upper teeth. Follow the same course.

It may be seen that the examination of patients applying for dental attention should not be the cursory procedure frequently observed by many practitioners. Recognition of the existence of oral foci of infection and their far-reaching influence on the health and well-being of the entire organism, as well as increasing knowledge of many vague manifestations of reflex disturbances, associated with oral pathological conditions, have become of such importance in their bearing on the practice of dentistry, that it is difficult to foretell what is to be the future status of the profession. Dr. Charles W. Mayo, of Rochester, Minn., has said recently that in his opinion dentistry is destined to become the most important of all the professions in its bearing on the health of the Nation.

Dr. Weston A. Price, of the Research Institute of the National Dental Association, whose private practice consists exclusively in the diagnosis and treatment of referred patients suffering with disturbances of a vague nature, as well as other prominent investigators, now make an extremely minute examination of all patients, including personal and family history, blood, salivary and urinary tests, pathological, bacteriological, serological, immunological, and toxicological analyses, as well as radiographic and oral inspection. These procedures may not always be necessary in the handling of routine cases, but for diagnosis of masked conditions, the value of many of them may be readily recognized. In this connection Dr. Thomas B. Hartzell remarks in a recent article in the *American Journal of Surgery* that, "We need to emphasize the fact that modern means of laboratory diagnosis and the taking of case histories, with the modern X-ray pictures, should be the foundation stones upon which conservative or destructive dentistry should be determined."

RESTORATION OF THE CONTACT POINT AND SEPARATION OF THE TEETH

A study of the "human form divine" will reveal the fact that mother nature has originally designed, or gradually evolved, faultless models; but, through inheritance or environment, acting over long periods of time, these ideal forms often have been marred and less perfect conditions produced. In no case may this be better illustrated than in a study of interproximal spaces, embrasures and contact points.

In pursuing this aspect of the subject, we find that the ideal conditions at which nature aims, but frequently fails to produce, in these localities, are the following:

First, a perfect V-shaped interproximal space between two adjoining teeth; this space gradually widening out to the labial, or buccal and lingual sides.

Second, well rounded interproximal embrasures, those on the lingual aspect being more pronounced in the posterior part of the mouth, while those on the labial side are more marked on the anterior teeth.

Third, the base of the triangular-shaped interproximal space is at the alveolar border, while the apex is at the points of contact.

Fourth, these so-called "spaces" are, under normal conditions, not really spaces at all, but are completely occupied by healthy gum tissue.

Fifth, the ideal form of contact between two approximating teeth is similar to that produced by placing two marbles together—the "marble contact point."

Sixth, the average measurement of the normal arch in early life from the distal surface of the third molar on one side to that of the other side, through the contact points, is one hundred and twenty-seven millimeters, (about five inches); while the average total measurement of the mesiodistal diameter of the teeth at the gingival line, is eighty-nine millimeters (about three and five-tenths inches); leaving the average total measurement of the bases of the interproximal spaces as thirty-eight millimeters (about one and five-tenths inches).

These ideal conditions, as previously mentioned, are not always produced, and even if originally present, frequently are marred by the stresses incident to time, wear, local irritants, constitutional disturbances and imperfectly-performed dental operations. A class of contact, frequently observed, is broad and flat and found in connection with so-called "thick-neck" teeth. This is far from the ideal form. A similar variety is often produced with age, through interproximal wear, as a result of the sliding of the contact points against each other, and the formation of broad facets in these localities. At a period of about forty years of age, the average length of the arch is usually diminished one centimeter, or about one-third of an inch, through the drifting forward of the teeth, as a result of interproximal wear and caries. From these two causes, as well as those incident to age, imperfectly-restored proximal fillings, local mechanical irritants and constitutional disorders producing lowered vitality of the tissues, the gum septum—which in the early periods of life is full and resistant—frequently is absorbed and affected with various pathological disturbances.

A study of the morbid anatomy of the affected tissues is exceedingly interesting. Very briefly, we may say that the histopathology of these conditions may be tabulated as follows, viz.:

First, properly-designed contact points protect the highly-sensitized and delicately-formed gum septum against the buffeting of food masses.

Second, destruction or imperfect restoration of these contacts facilitates accumulation of irritating substances and leads to too vigorous use of tooth picks and similar implements for their removal.

Third, this results in: (a), arterial hyperæmia; (b), venous hyperaemia; (c), inflammation, either acute or chronic, of the superficial tissues accompanied by pain, deepening of the gum color, bleeding and hypertrophy in the acute cases, with subsequent absorption in the chronic cases.

Fourth, an extension of these processes occurs in the interstitial submucous tissues, periosteum, pericementum and bone, the vasomotor nerves of the part being first stimulated, then overstimulated and finally paralyzed.

Fifth, if infection does not occur, degeneration and absorption of these tissues results in the formation of a pocket, which further facilitates accumulations of food.

Sixth, fermentation and putrefaction of carbohydrates and proteids occurring in the majority of cases, results in suppuration and pus formation, with destruction of the soft tissues, and a rarefying osteitis and caries of subjacent bone.

Seventh, ultimate loss of the affected teeth and an extension of the pyorrheal condition to those adjoining is the result.

The fact already has been accentuated that nature frequently fails to construct ideal contact points. The dentist always should endeavor to produce them and thus improve on nature. When interproximal wear exists the patient often will complain of discomfort in these localities. In cases of this character the teeth should be separated, and even if no evidences of decay are present, cavities should be prepared and normal contact points built over full in order that the condition may be relieved. In cases of large proximal cavities the teeth have frequently drifted together. They should be lifted apart sufficiently to restore their mesiodistal diameter, and normal contacts built. Recalling the fact, previously stated in regard to the shortening of the total length of the arch with age, resulting in a lessening of the area and power of the masticating machine and a narrowing of the interproximal spaces, an effort always should be made to restore normal conditions by separation and the accentuation of contacts in every instance where operations are to be performed on proximal surfaces of teeth in the mouths of patients of middle age and beyond. Separation is not only advisable, but absolutely necessary in every instance, if the best results are to be obtained. A study of the accompanying illustrations (*Figs. 67, 68, 69 and 70*) will indicate the ideal form of contact point and interproximal space to be reproduced in operating in these localities.

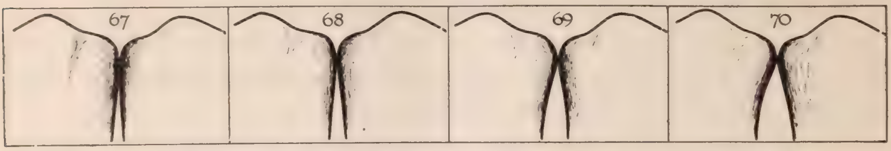


Fig. 67—Broad and flat contacts, far from ideal—narrow interproximal space.
Fig. 68—An improvement over the condition shown in Fig. 67. The interproximal space is much too narrow.
Fig. 69—This illustration approaches nearer to ideal conditions.
Fig. 70—Ideal contact points. Note the broad V-shaped interproximal space.

132. Why is *Separation Necessary?*

First, for proper examination of interproximal spaces.

Second, for proper restoration of anatomical contours and normal contact points in fillings.

Third, for preservation of healthy interproximal gum tissue.

133. Give five reasons for the maintenance of normal *V-Shaped Interproximal Spaces.*

First, for conservation of healthy gum tissue.

Second, to prevent impaction of food.

Third, to enable patients to most readily accomplish the cleansing operation.

Fourth, to insure permanence of fillings.

Fifth, for esthetic appearance.

134. Name *Two Varieties* of Separation.

First, slow or previous.

Second, rapid or immediate.

135. Name the *Advantages and Disadvantages* of slow separation.

First, advantages.

A. Comparative lack of soreness, except with rubber.

B. Diminution of danger to the fibers of the pericementum.

C. Ability to temporarily force away, with gutta percha, swollen gum tissue from the gingival margins.

Second, disadvantages.

A. Slowness.

136. Name the *Advantages and Disadvantages* of rapid separation.

First, advantages.

A. Quickness.

B. Steadying or prevention of movements of the teeth during the filling operation.

Second, disadvantages.

A. Danger of rupture of the pericementum and permanent loosening of the teeth.

B. Pain.

137. Which *Method is More Frequently Used?*

Rapid separation, although this is not always advisable, or possible.

The two methods are frequently combined.

138. Name the *Materials* used in *Previous Separation.*

First, gutta percha (base-plate or any variety of permanent gutta percha).

Second, cotton (dry and frequently changed).

Third, wood (orange-wood or hickory).

Fourth, linen tape (covered with wax or chloro percha).

Fifth, Rubber (rubber dam, orthodontia bands or separating strips).

Sixth, cork.

139. Describe their *Method of Use.*

First, gutta percha. Pack the cavity over-full, avoiding the danger of too much pressure on the gum, and instruct the patient to use the tooth vigorously. Leave in position for several days or weeks and renew if necessary.

Second, cotton.

A. Twist the dry cotton into a small rope and force in between the contact points, cutting off protruding ends.

B. Or in case of a large cavity, pack as full as possible.

C. Or pass a ligature into the interproximal space, allowing it to rest on the gums, when, after the adaptation of the cotton, tie it in place, making the knot over the contact points.

D. Or tie a pledget of cotton in the center of a ligature, draw it into place in the interproximal space and tie into position as before.

Third, wood.

A. Trim an orange-wood stick into a wedge of suitable size and shape, force carefully into position and cut off the excess with wedge-cutting forceps.

B. Or cut a deep notch in the wood where it is desired to remove the excess, and after insertion of the wedge break it off at the location of the notch.

Fourth, linen tape.

Force the tape into position and cut off the excess with scissors. Remove it in a day or two and insert a thicker piece, or double it upon itself, continuing in this manner until the desired space is secured.

Fifth, rubber.

Its use is *undesirable* in the majority of cases on account of the soreness produced. If used for special reasons, stretch and force into position just beyond the contact points, avoiding pressure on the gums. Remove the excess with a pair of scissors and allow it to remain in position from twelve to twenty-four hours. If extreme soreness is produced, maintain, by means of gutta percha, the separation gained, until all soreness subsides. Rubber separating strips should largely be avoided for this purpose, using preferably a small strip of rubber dam or orthodontia band.

Sixth, cork.

Force properly-shaped pieces of cork into position, increasing the size at each visit, until the desired result is obtained.

140. Name several *Prominent Mechanical Rapid Separators.*

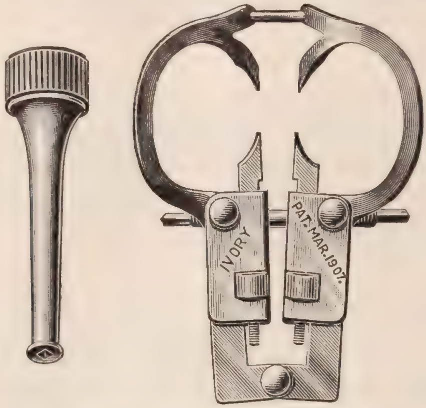


Fig. 71—Ivory adjustable separator.

The Ivory Universal, Ivory Double-bow, Ivory Adjustable (*Fig. 71*), Perry (set of six), Perry Universal and Elliott Separators.

141. Enumerate six *Uses of the Rapid Separator.*

First, for examination of interproximal spaces.

Second, preparatory to slow separation.

Third, to maintain space gained by previous separation.

Fourth, for preparation of cavities.

Fifth, for insertion and polishing of fillings and inlays.

Sixth, for removal of foreign bodies, such as berry seeds, fragments of toothpicks or bone sequestra.

142. Describe the *General Method of Application* of mechanical separators.

The force should be applied very slowly and gradually, at the same time encouraging the patient by tactful methods. In cases where the teeth are exceedingly close and firmly implanted, it is wise not to force the instrument too much, but rather to adopt a combination of the rapid and slow methods.

NOTE—The articles by Dr. McGehee appearing in THE DENTAL SUMMARY are extracts from his forthcoming text-book, to be published early in the fall by The Ransom & Randolph Co.

(*To be continued*)

IMPORTANCE AND SCOPE OF PARTIAL DENTURE PROSTHESIS*

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I NEED NOT spend any time calling your attention to the importance of this branch of our practice. I am sure you are aware that at this time we are confronted with the problem of supplying our patients with artificial substitutes for the great number of teeth that are being extracted. There never was a time in the history of the profession when partial denture construction was of greater importance and interest than now.

I use the term "partial denture prosthesis" in a particular sense, recognizing that the term includes all types of partial dentures, both fixed and removable. We have been in the habit of using the terms separately, applying the term "partial denture" to partial plates, and using the term "crown and bridge work" for all types of fixed appliances. My preference is to include fixed bridge work under the general term "Partial Denture Prosthesis."

While I do not intend to devote any time at all to the discussion of fixed bridge work, I would like to make this plain to you as a matter of the better understanding in a discussion of the subject. We must at this time take a different view of partial denture construction than in the past. We have been making fixed bridge work for a great number of years, and no doubt making too much fixed bridge work. There have been many men in the profession who have recognized the abuses of this splendid method of supplying artificial substitutes for the natural teeth, but it never has been so forcibly brought to our attention as within the past few years. The knowledge we have of the mouth as an area of focal infection has led us to the conviction that we must do less fixed bridge work, and better fixed bridge work when we do use this fine appliance. And I believe the profession is coming to a realization of the fact that we must use more of the removable type of appliance.

That means that we must make better partial plates and use more partial plates. There is no means at hand, today, in my judgment, that so nearly meets the requirements of supplying artificial substitutes for the lost teeth as partial plates.

A few things have transpired within the last ten years that have made possible the betterment of this part of our work. I want to mention briefly what to my mind have been the factors instrumental in bringing about the possible improvement of partial plate work or removable appliances—you may call them removable bridges, or anything you wish.

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*Stenographic report of lecture before the Indiana State Dental Association, 1919.

I mean to include both partial plates and removable bridge work. First and foremost of these factors, to my mind, is the development of the casting process. Without that, partial plate work or removable appliances would not have the extensive application they have today. We must give credit to the inventor of that great process, for he has been of tremendous help to our profession.

As applying to the universal method of attachment, or to the one means of anchoring our partial dentures that is most universal, (the use of clasps, with the addition of this splendid casting process), that has made the method more universally applicable and useful, is the betterment of the alloys we use in the casting of our clasps. In addition to the alloys given us, made up and manufactured for this purpose, we have alloys especially adapted to the various other parts of our appliances; and then the simplifying of the materials, which has made this work more simple, positive, dependable and more universally applicable.

Before going into the technic, I want to spend a few moments in referring to the principles that must be understood in order to have a better appreciation of the subject. First, I want to refer to some of the principles underlying the employment of clasps as a means of anchoring partial dentures, either partial plates or removable bridge work. The clasp, I believe, is the form of attachment that may be used most successfully, and it is to the *cast* clasp that I want to call your attention, so that in referring to the principles underlying clasp construction or clasp dentures generally, please bear in mind the cast clasp. It is my judgment that the majority of the profession do not appreciate the possibilities of clasps, and particularly is that true with reference to the cast clasp. The cast clasp in its perfected form, in its simplified technic, using the modern methods, the newer alloys, has wonderful possibilities, and I hope every one of you will come to a realization of its possibilities. It is primarily a conservative method. The employment of the cast clasp in its various forms makes possible the supplying of these artificial substitutes in a safe, sane and conservative way, in a way that need not extensively mutilate the natural teeth. The mutilation of the natural teeth and the devitalization and removal of vital pulps is a thing we should have constantly in mind, and I believe the cast clasp in its various forms makes possible the most universal means of anchoring our various types of removable appliances.

I believe that clasps should fit accurately the teeth to which they are attached in order that the best results may be obtained. The clasps should be made to occupy a definite and permanent position on the teeth. I believe that clasps should have a reciprocal bearing on the teeth to which they are attached. I believe they should have some form of occlusal rest for resistance to the masticatory forces, so that they will be held permanently in a given position on the teeth. I believe that all types of clasps that do fit the teeth accurately, and take a firm grasp upon the teeth, must have an accurate relation to the saddle bearing on the ridge and the clasp. In other words, the clasp and the saddle shall be so accurately related that we may have a coordination of the clasp and the saddle in the resistance to the forces of mastication. In addition, I think all of the cast clasps should be polished and smooth on all surfaces, and especially is this necessary on the surface adjacent to the tooth, so that we will have clasps that can be kept clean. A clasp that fits the tooth has much greater efficiency than one that only approximately fits; the more accurate the clasp, the more efficient it is; it has a more definite attachment, the attachment is more positive and secure, the stabilizing effect of the clasp is much greater, there is much better and stronger resistance to the forces of mastication, and consequently it is a decidedly more effcient type of appliance.

With reference to the occlusal rest, I know there has been considerable discussion about occlusal rests, or about the type of appliance that is put on the tooth in such a way that there is no opportunity for the clasp to settle. I know many of you will not agree with this principle, and under certain conditions I do not agree that all clasps should keep a definite position on the tooth so that there is no chance for the clasp to settle. There are conditions where we would not think of putting in a rigid clasp that grasps the tooth definitely and has no provision for the settling of the clasp, as in cases of recent extraction, or the presence of cartilaginous ridges where there will be absorption; we have in many of those cases narrow thin, cartilaginous ridges that offer no stability or support to the saddle, and we would not think of putting in this type of appliance. We would have such a strain on the teeth that it would result in their destruction. But in the great majority of cases I believe this principle is rightly founded.

With reference to the accuracy of relation between the saddle and the clasp, there can be no question as to the necessity of securing it under all conditions, regardless of the condition of the alveolar ridge, regardless of the condition of absorption; we should have an accurate relation, so there is no undue strain upon the appliance. The more accurate the relation between the clasp and the saddle, the more satisfactory will be the result.

In many extension saddle cases, those cases having attachments or clasps at one end of the saddle only, there is great likelihood of damage to the teeth to which they are anchored. The anchorage then of this accurately-fitting clasp in extension saddle cases must be done with care and with a full appreciation of the dangers to the teeth to which we are anchoring the appliance. We may, in many of those cases, use an ordinary type of clasp, an ordinary horizontal band, or half-round, or any form of clasp that will settle with the absorption that takes place. But I haven't much patience with clasps of that sort. As a rule, they are more or less of an indifferent nature. In my judgment, the only case where the loose fitting or indifferently-fitting clasp is indicated is on lower bicuspids and extension saddle cases.

One of the principal reasons why we are not getting more satisfactory results from our partial dentures, is that we haven't given the proper attention to securely and accurately fitting the appliance in such a way that the appliance goes to place and keeps a definite place, and is held securely and rigidly and positively in its place.

I have no quarrel with fixed bridge work. I am still a believer in properly-constructed bridges in judiciously-selected cases. But we must better our removable appliances, so that we may meet the requirements of service and comfort to the patient, and to do that we must make our removable appliances more secure so that they will occupy a more positive position in the mouth.

The equipment and materials we use in making these cast appliances I have had printed on cards:

MATERIALS USED IN ROACH CLASP TECHNIC

Impressions: Complaster and Roach hinged tray for molars and bicuspids. Modeling compound in sections for cuspids and incisors. Plaster of Paris for saddle areas.

Separating Media: Liquid Silex one part to warm water four parts.

Models: Most any good inlay investment compound may be used for clasps and short bridges. Cast plaster for saddles.

Wax: Any inlay wax for clasp patterns. Kerr's or Ransom & Randolph's sheet wax 28 and 30 gauges for saddles.

Gold Alloys: For clasps, Ney's Oro E., Dee's No. 3, Goldsmith's Castgo W., Ney's Elastic for embrasure hook. Gauge 17-18. For saddles, Dee's No. 1 Oro. B.

Investment: Any good inlay investment compound.

Casting Machine: Any casting outfit will work if your technic is right. A good blow pipe and a tin can lid with two or three layers of blotting paper may be used successfully.

The first model I will show you is the clasp we call the mesio-distal grip clasp, (*Fig. 1*). It is a new principle of clasp construction, I think. It grips the tooth mesio-distally, and is especially adapted to the anterior teeth. The molar clasp is a type of ordinary clasp with which you are all familiar, the bucco-lingual contour grip for molars and bicuspids. (*Fig. 2*).

In the construction of partial dentures of all types, the best results are secured if we follow a step-by-step sectional procedure. It is the most accurate way of doing this work, and the most accurate is not any too good. The plan we have followed in the past of taking impressions of the mouth as a whole with plaster of Paris or any other material at hand, and either constructing ourselves or sending to a laboratory this impression of the entire mouth and expecting the best type of an appliance, cannot too strongly be condemned. It is impossible to make the best appliances in this way. I want to emphasize the importance of taking a more personal interest in it and doing more of this work ourselves. We cannot afford to take indifferent impressions and send this work to a dental laboratory. I have no quarrel with the dental laboratories. They are splendid aids, but let us give the laboratory man a chance, and let us not send him these indifferent impressions.

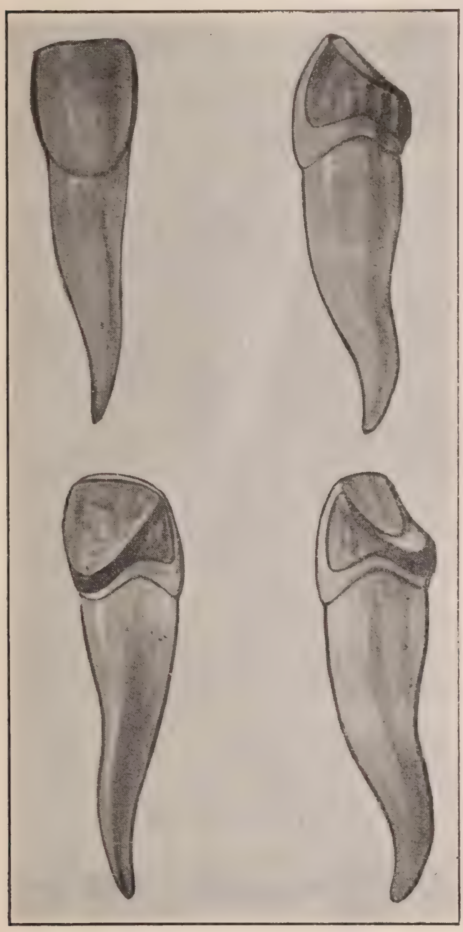

Fig. 1

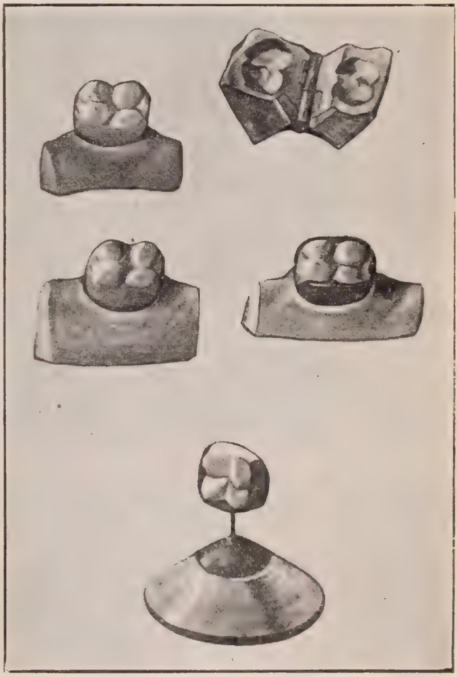

Fig. 2

Fig 1.—Mesio-distal grip clasp, showing two forms; a and b show labial and lingual view of clasp as made when occlusion will permit; c and d show modified forms for close bite.

Fig. 2.—Bucco-lingual contour grip clasp. a, original; b, complaster impression, using c closed-end split tray; c, model; d, waxed up; e, mounted.

Many times we see impressions taken in beeswax, a combination bite and impression, sent in with request for a partial plate. Those are not artificial substitutes for the natural teeth; they are jugglers' jobs. Some have gone to the other extreme. They are going into mechanical monstrosities, and spend too much time on intricate and complex appliances. Let us take the middle ground, and select materials, processes and methods that are comparatively simple, do more of this work ourselves, and do it better. And we can only do that by becoming more familiar with these methods.

The great advantage of doing this work in sections, taking impressions in sections, making the various parts in sections and assembling the parts, is that we can get a more accurate adaptation of these smaller units, performing the major part of the work ourselves.

In taking impressions for partial dentures we follow the sectional plan. We take impressions individually and separately of each tooth we are going to clasp. We will devote our time to cast clasps. What materials and what procedures are best for taking the impressions is the first question. Every case is a law unto itself, and requires individual and careful study, in order that we may employ the design best suited to the case. In taking the impressions of the teeth, we find only two materials suitable, complaster and modeling compound. Complaster is plaster of Paris and potato flour combined, and it dissolves in boiling water. It makes the thing surer, and simplifies securing a model upon which we can place our wax and cast. We are making the cast clasp by the direct method; in other words, we are casting directly onto the model. We are making the models of these teeth that are we going to build clasps upon of an inlay investment compound of some kind. Some claim they can cast well on crown and bridge investment, or Weinstein's artificial stone, or other materials. I haven't been successful with those materials. Crown and bridge investments are too coarse; they do not give you a smooth surface, you do not have a smooth casting, and there is a possibility of not getting a smooth clasp. To get the models smooth, we must have as smooth an impression as possible. We use complaster for the posterior teeth, molars and bicuspids principally, because it can be more successfully forced into and around the teeth. It flows freely and copies the fine lines accurately, and hardens and breaks in a sharp line. After it is hardened we pour it up with our inlay investment compound, a rather frail material; you can place it in a vessel and bring it to a boil, and your complaster will dissolve away, so you are not subjecting your model to the strain incident to separating it from the plaster of Paris.

I have been unable to find any material so universally smooth as modeling compound. It is, however, a treacherous material to use for taking impressions. If it is handled right, in a certain class of cases, I know it is dependable; but I believe modeling compound as a material to take impressions for clasps should be limited to the anterior teeth where it can be handled and taken in sections. I haven't seen one case where a tooth was so shaped that a proper impression could be taken in modeling compound *en masse*. You cannot get the contour and the entire impression of the tooth without taking it in sections; either by taking it in complaster or plaster of Paris and breaking it in sections, or in modeling compound and placing the modeling compound around the tooth in sections, so that you have each of those sections under definite and positive observation, so that you know the material has gone into accurate apposition to the surface of the tooth of which you are taking the impression, is necessary. If you depend on modeling compound *en masse*, and expect to break the modeling compound out as you do plaster of Paris, I believe you will not get dependable impressions. Modeling compound, even though you confine it in all areas around the tooth of which you are taking the impression, is not of universal uniformity of plasticity, so that it will flow around all the surfaces of that tooth accurately. It is likely to be harder in some portions than in others, and the more plastic parts will be forced away from surfaces that you want to copy.

In handling complaster, taking impressions of the posterior teeth, it is easily worked. The complaster is in a powder like plaster of Paris, and has pretty much the same working properties. The manufacturers recommend that we use a little salt to hasten the setting. Many of the packages I have tried do not require salt, and it is best not to use salt because it will set too quickly. It should be mixed to a stiff creamy consistency, so that it has a free flow. We want the material to flow around the constriction of the tooth. If we do not get accurate impressions, we won't have accurate work. We want an exact reproduction of the tooth, so that we can design our clasp properly. The complaster should be worked, so that you can force it to place, and it must be confined. If you use an ordinary crown and bridge tray open at both ends, and attempt to take an impression of a tooth standing alone, you are likely not to get an accurate impression of that tooth in and around the sides of the tooth at the open end of the tray. It is safer to have the material confined at all surfaces, and I prefer a tray closed at both ends.

A molar tooth standing alone is the most difficult of the posterior teeth, the second and third molars particularly, to take. This box-like tray was designed primarily for use with modeling compound. I felt I could force the modeling compound down around the tooth, but this did not work well, so I abandoned the modeling compound. I happened upon a sample of this complaster, and it met the requirements in an ideal way. The only difference between this tray and the ordinary hinged tray is the flanges extending anteriorly both proximally and occlusally to give us a line of cleavage.

Where there are adjacent teeth, we have an open-end tray so that it may be placed down in position. The presence of the adjacent teeth assists in confining the material.

Liquid silex should be used as a separating medium. This material is subjected to a boiling temperature, and liquid silex is best. It should be diluted from three to five parts; I usually put in three or four parts of water to the liquid silex as it comes from the dealers. If you use it as it comes from the dealer and are not very careful, you will get rough models from the very best impression you can take, because it will not be absorbed into the impression material, but will form a coarse, heavy layer; and if you put it aside for half an hour after you have coated it with liquid silex, it becomes very rough. You do not have to wait for your impression to dry out as you would with your shellac varnishes. Paint your impression immediately with this thin solution, take off the excess, and then pour off your model and run up your impression at once while your impression is still moist. If you set it aside for some time, always moisten your impression. If you do not, when you pour in your impression compound the dry impression material will take out some of the water that is in your investment, and you will have an impression crystallization, an imperfect hardening of the surface, and won't have an accurate impression.

Many have been using investment compounds in the wrong way. We must use some investment compound that is smooth, so that we may have a smooth model. The investment compounds are all very frail. I know of none but what can be used successfully in making models, providing you add a little plaster of Paris. Even Weinstein's inlay investment compound can be used by the addition of about three parts of plaster of Paris. If you mix your investment compound stiff, you need not add plaster of Paris. You do not have to have it of that watery consistency that you would if you were investing an inlay. Pack your investment into the tooth well, and jar it down, and you can get a smooth model with a thick mix, and you have a strong model, and it will be ready to separate in less time. Instead of waiting for half an hour or an hour, you can put it in warm water and boil it, and within ten or fiteeen minutes you can separate it without any danger.

If we have followed the proper steps, we should have a smooth model upon which we are to cast our clasp. You may make the casting a little smoother by the use of this liquid silex, painting it onto the model. You can paint it on immediately. You can set that model away indefinitely, and you will not have the rough frosty growth on it that you would with a plaster of Paris model.

The next clasp I want to take up is the combination cast clasp and embrasure hook. The bucco-lingual contour grip for molars and bicuspids has the widest range of usefulness. The combination cast clasp and embrasure hook has a number of advantages. The clasp extends around only part way buccally. Distally we have a casting, and anteriorly-lingually we attach a wire that extends up from the incisal or occlusal as the case may be, and passes down into the embrasure between the two teeth. One advantage is that it is less conspicuous, while it is equally as efficient as the bucco-lingual contour grip. It is specially adapted to bicuspids, both upper and lower. Then, due to the fact that it is a clasp with a wider range of flexibility than the solid cast clasp, it is especially adapted to the lower bicuspid. It will pass over the bell formation of the cuspid tooth, and will resume its form by reason of the greater flexibility, and take hold of the tooth. We may use this same principle on cuspids, but I do not find it applicable on teeth more to the front of the mouth than cuspids. It obviates the necessity for cutting away the contact, such as would be necessary in the construction of the mesio-distal grip clasp. The mesio-distal grip clasp is the type of clasp that grasps the tooth mesially, passing around the lingual side of the tooth. The fact that this wire extends over the occlusal or incisal, as in the case of a cuspid, avoids the necessity for removing a certain amount of the tooth in between the teeth. We must have the clasp take hold of the tooth in a way so that the tooth will be held in the grasp of the clasp; the clasp must encompass the tooth to the extent that when we tighten one side of the clasp, it will be opposed reciprocally by the extension or wing of the other side of the clasp.

The combination cast clasp and embrasure hook is to my mind one of the most useful types of clasp. It has a wide range of application, it is a valuable means of attaching to the natural teeth, with the least possible mutilation and with the greatest possible security of attachment.

In unilateral cases, where we have occasion to anchor an appliance on one side of the mouth where there are no teeth out, sometimes it is necessary to run part of the appliance across to the other side of the mouth to properly support the appliance; this device forms a splendid means of making an attachment to fixed bridges or to the natural teeth by passing these little hooks over to the opposite side of the mouth. We never should use this on a tooth where we have an adjacent tooth, for in a case like that we would have only one way of tightening that, and that would be into the space. That is of little value, for in tightening it, it serves only as a wedge between the teeth. All forms of the clasp should be applied to the tooth you are clasping in a way that it is reciprocally resisted by some other part of the clasp. Make in that case two hooks, so that you will grasp the tooth both mesially and distally on the buccal side, and then get a proper reciprocal bearing upon the tooth.

The combination wire and cast clasp has a further usefulness. We make these cast-clasp combinations in two forms, one single and double embrasure hook form, or the open-loop type of clasp, and then we make another form, using a combination casting and the continuous loop, where both ends of this wire are attached to the casting, giving to the clasp the maximum strength with a slight amount of flexibility. The loop permits of a slight spring in the clasp with the greatest possible strength. You can make a clasp of this type that occupies a much smaller area on the tooth, with a great deal more strength than if it were of open-ring type, because of the continuous union of the flanges of the clasp with this wire.

The next clasp is the mesio-distal grip clasp, (*Fig. 3*), which is a clasp intended primarily for attachment to the anterior teeth. You recognize the difficulty of clasping the anterior teeth. I know of no other means of attaching to a vital sound tooth anteriorly that is nearly as good. It is a valuable means of anchoring many of these removable appliances. There is an objection to the employment of these clasps, an objection to the employment of all of these accurately-fitting clasps. The only objection that can be found to the cast clasp as a means of anchoring partial dentures is the danger of decay around them when they occupy large areas of the tooth and accurately fit the tooth. We must recognize the danger of decay. I have had men tell me they would not use this clasp because they believed there was too much danger of this. I have just as much patience with that sort of conservatism as I have with the man who said the automobile was a dangerous thing to use and so he wouldn't ride in one. Many useful things are dangerous. I am conservative, but I believe as between mutilating the tooth and bringing in pulp complications, that my plan is the more conservative plan. In taking this chance I am careful in selecting my cases, and I would not put this clasp in where I saw strong evidence of decay. And I insist on the patient keeping these appliances clean. I make them so they can be kept clean, and then I follow the cases up and see that they are kept

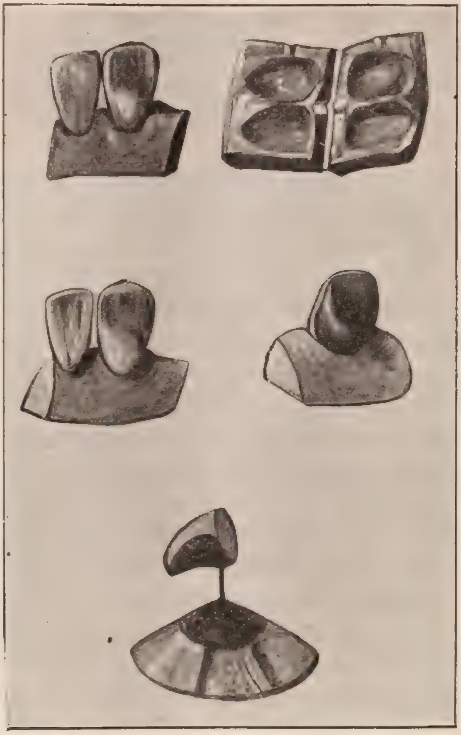

Fig. 3—a, Model of cuspid and lateral in normal contact; b shows contact removed as prepared for mesio-distal grip clasp; c, sectional modeling compound impression; d, tooth waxed up; e, excess of model cut away and pattern mounted ready for investing.

clean. I have them lifted out at night. Take advantage of this possibility of the cast clasp in its various forms, but make use of it intelligently and fairly, and I am satisfied, if we are fair and will instruct our patients to take care of them, the results will be good.

The mesio-distal grip clasp's greatest field of application is to the cuspid teeth. It has a distinct advantage over the labio-lingual type of clasp. The labio-lingual type of clasp is, as a rule, of little value. The natural shape of the tooth, conical in form, with the greatest diameter labio-lingually at the gingiva, gives us little opportunity to get a grasp on it, and a clasp with one surface as a help to prevent the plate from falling, which at best they won't do, and which must be used with partial plates, does not amount to much. The mesio-distal grip clasp can be made so that it grips the tooth securely. Reduce the contour so that you have a flattened surface of the tooth proximally, paralleling these surfaces, so that you have the tooth in form for making the clasp. We must mutilate these teeth to a certain extent. It is necessary to dress off to some extent the excessive contours. I do not remove the enamel entirely from the tooth, but just dress off a slight amount to facilitate the placing and removal of the appliance. The preferable form is overlapping the entire lingual surface. This clasp is not a universal attachment, any more than any other means of doing a thing is universal, but it has a very valuable place. Dress off the contour of the tooth preparatory to taking the impression. The impression is the most difficult I have tried to take, as simple as it may seem. It is difficult because of the necessity for getting an accurate impression of the septum between the teeth, an impression of the entire mesial surface clear down to the constriction. We want an impression of the slight constriction below the surface where we have planed it off. Round the surface, have a place between the teeth of about twenty-six B&S gauge; that will give you sufficient thickness for your clasp.

It is impracticable to take this impression with plaster of Paris or complaster, because the septum will be broken up into small fragments, and the impression will not be of value. To get an accurate impression it should be taken in modeling compound in sections, and it is rather difficult to get the exact impression. You should force the excess back and into the space between the teeth. Take a small piece of modeling compound, just enough to get an impression of the lingual half of that one tooth, and form that into a wide-based cone, and then chill the base. It must be done quickly. Dip the base of the cone into cold water and chill it, take it by the base and hold it in a small hot flame and superheat the point of the cone, then force the point of the cone into the septum. As this soft material forces out labially while we are forcing the mass around the lingual and distal sides, catch the excess from the lingual side and force it back and pack it down in between the teeth below the contour of the tooth. We are going to carry our clasp a little below our planed surface that we have made. In normal teeth these clasps will hold so securely that you cannot pull them off with your fingers. I am devising now a small tool that the patient may take with him to take these clasps off.

After you have the lingual half of your modeling compound in position, cut away all the excess extending labially, cut back half way through the septum, cut away your distal half to the half-way line of the tooth, and then remove it, and put it back. You can see whether it is in direct apposition to the tooth. If you haven't the apposition with the lingual half, you may as well start over again. If you have an exact impression of the lingual, all you need do is to repeat the impression for the labial half. We want an impression of the labial surface of the tooth just enough so that the extension of the clasp labially will encompass the tooth enough so that the clasp will not be dislodged lingually. In dressing the tooth off, we must round off the corners that are left there. This clasp holds securely, and is not conspicuous.

The most accurate results will obtain in the construction of these appliances by making the appliance in sections, taking impressions in sections, and assembling those various parts of the appliance on the model in the mouth, following step by step the sectional plan, to reduce to the minimum the misfits that are likely to occur.

I am going briefly to outline first the technic and the selection of cases for vulcanite construction, or discriminate between vulcanite and gold saddle construction. We believe that in the great majority of cases where we have full absorption, the very best results will be obtained if we employ gold saddle construction. It is more practicable to construct these appliances of gold. The gold construction is very much more compact, is less cumbersome, less bulky for a given strength, and gold construction is a more sanitary construction, and gives us an appliance that meets all the requirements of the case better than does vulcanite. For these reasons we prefer, wherever possible, to use gold and porcelain only. I realize that the employment of gold and porcelain construction is not possible in some cases. On the other hand, I want to insist that many more of these cases can be made, using gold and porcelain alone, than are being made, and I want to make an earnest plea for the use of the gold and porcelain construction. As to the difference in cost to us in the manufacture of these appliances, there isn't any great amount. I dislike to enter into the question of the cost of appliances, but knowing the argument and objection so often made to the use of gold saddle construction, that the patients cannot afford to pay for it, I feel I am justified in referring to this phase of the subject. I have arrived at the conclusion that we can employ this superior quality of material a great deal more from experience in a large college clinic, than from my own private practice. In the college clinic we have to deal with poor people, and I find many of them will come into the college clinic and ask for this kind of an appliance because some one else has that type, and they are willing to pay an adequate fee because they recognize the superiority of the appliance over the ordinary juggler's job of rubber plate.

It is comparatively easy to sell a superior service of this kind, using a superior material, on a competitive basis, as compared with fixed bridge work. So the idea that prevails that we must have a larger fee for removable appliances of gold saddle construction is not the correct one. We should take more individual interest in this work, and try to deliver a better service. There are many more people than we think who are willing to pay for this superior service.

In my judgment, vulcanite can be used in many cases very satisfactorily, not to compare with the gold construction; but there are many cases where vulcanite can be used successfully, providing we follow a careful technic in the construction. If we are to make vulcanite appliances using the cast clasp, let us do that in a way that we will produce a superior service. I have no patience with the plan suggested of making a saddle of vulcanite, making a cast clasp and vulcanizing the saddle, following the double vulcanization plan of making the saddle and then securing the relation of the vulcanite to the clasp with the saddle under pressure, and then uniting the clasp and saddle by another vulcanization, or vulcanizing the clasp and the saddle at the time the teeth are being attached. We will spend a great deal of time in that way, and then have a cheap job. You haven't given a service equal to the gold, and you have put the most valuable item into your work, namely, your time. We are many times "penny wise and pound foolish" in these things. Let us use the better materials and give a better service.

If we are going to use vulcanite, we must follow the plan of taking an impression of the entire mouth, and completing the case in one vulcanization on a single model from a single impression of the entire mouth. Then if we are going to use the cast clasp, which is practicable and will be superior to the ordinary type of clasp, let us take the impression of the teeth we are going to clasp, and make our clasps, fitting the clasps to the teeth to which we are going to attach. In making vulcanite cases where we are using the cast clasp that rigidly telescopes and grasps the tooth firmly, we must have a more secure anchorage or attachment of the clasp to the vulcanite than in an ordinary clasp that only approximately fits the tooth. These clasps are stiff and rigid, and have a definite grasp on the tooth, in many cases so secure that it is quite difficult to remove; and the patient in taking the appliance off will exert considerable leverage, and the clasp may be torn from its anchorage; so that we must increase the strength of the lug with which we do the anchoring. Make the lugs short and heavy, and preferably one or two round wires attached to the tooth, placing one of the wires to the lingual and one to the buccal side, so that we have the attachment of the lugs distributed, placing the two wires, say fourteen or fifteen gauge, and bending them off so that they will be extended into the rubber at least one-eighth inch. The ordinary thin piece of metal that is used so frequently is inadequate, and may be torn from its anchorage. Solder on these lug attachments for the vulcanite, place the attachments in position in the mouth, and then take the impression of the entire mouth with plaster of Paris, securing a good impression of the surfaces of the mouth over which the plate is to rest, in addition to securing an impression of the clasp. The impression then will have to be broken out of the mouth from around the clasps. You cannot remove the clasps with the impression, if the clasps are fitted to the teeth as they should be. They will not come away without expanding and opening in order to be dislodged from the tooth. The clasp then, with the lug attached to it, should be placed in position in the impression.

The plan suggested by Hall for securing a smooth surface of vulcanite is to treat your impression with collodion as a separating medium for your impression. We want to run our impression up with Weinstein's stone or Spence's compound, because the expansion and contraction are nearly nil in both, and we secure a smooth model over which we can vulcanize our rubber and secure a smooth accurately-fitting plate. The separating medium Hall has suggested is to my mind the best means of securing a smooth surface of these cast materials.

To use collodion in a way that will give us a smooth surface, Hall suggests we have about a pint of collodion kept in a closely-sealed bottle, and when he uses it for coating his impression he pours the collodion out into a vessel that will accommodate the entire impression. The entire impression is immersed in the collodion, and he allows it to remain for a minute or so. It is then removed and set aside to dry for a few minutes, and then dipped again and removed immediately from the collodion. This will leave a smooth continuous surface all over the surface of your impression, into which you can pack your Weinstein or Spence's compound and get a very beautiful smooth surface.

In addition to this, if at the time we are closing the flask and vulcanizing, we will paint the casting with liquid silex or collodion, (and I prefer the liquid silex), if you close the flask immediately before the silex has had time to dry, it will not shrink, and you will have a surface on the vulcanite that will compare very favorably with the surface you get against tinfoil. We then have our clasps held securely in our impression in the proper place. You have something definite to guide you in placing the lugs in position. When you separate it, your clasps are held securely in a good, strong substance over which you are to vulcanize, so there should not be any chance for the disarrangement of your clasps.

Then we come to the gold construction. The ideal material in my judgment, and it does not cost much more, is the gold and porcelain construction. The use of gold saddle with vulcanite attachment, using vulcanite to anchor the teeth to the saddle, is rather an apology, and the cost of production is as much as if we used the loose pin crown or the Ash tube teeth. My preference is for the loose pin crown. By grinding the crown flat over the ridge, it takes a little more time than to vulcanize the casting, but when it is finished you have something superior. It is all porcelain and gold. There isn't the tendency to separate there is between vulcanite and gold. The vulcanite always has a tendency to draw away from the gold saddle, and it makes a joint between, that is constantly filled with debris. This is not a sanitary piece of work. But with the gold saddle and porcelain teeth you have something you can boil, if you desire, and it can be kept clean; there is no place for the lodgment of foreign material, and you have continuity of surface. It is better to spend your time fitting the appliance to the patient than afterward trying to fit your patient to the appliance. If we do this, step by step, fitting each section carefully, we will have little difficulty, and you will later never have to touch it.

With reference to the adjustment of these appliances after they are made, I want to emphasize the importance of spending a little time, even though you have made the cast accurately and fitted it well; do not put the appliance in and send patients away, with the teeth on the appliance striking, too soon. If you do, your patients will be uncomfortable. Do not send them away and tell them it will seem strange for a while, but will settle, and they must wait for that and endure this irritation, and so on, when by spending a little time in the careful grinding of the teeth, the natural teeth will come into full occlusion. The first impression your patient gets of this appliance is a valuable part of the satisfaction your patient is to get. See that everything is as nearly right as possible. It is better to have the occlusion a little shy than too full, because if we are careful in this step-by-step procedure in securing the relation of the saddle to the clasp, we are not going to have any settling. I do not figure on the settling proposition at all. That is an apology for a "bum job." I want to see the work done better, and it pays to do the work well.

Of course there are cases where you must figure on settling. In these cases I adjust the appliance carefully to the occlusion just the same, but in those cases where you are certain of settling, as in cases of recent extraction, make those cases always of a temporary nature, of vulcanite. You can readjust the vulcanite appliance easily, make up for the shrinkage that takes place, and keep your appliance up to the proper occlusion by adding to the surface next to the ridge. That is necessary if we are to carry these appliances along in the way that will be of the best service to the patient. It is easy to refit the appliance as resorption takes place, with the use of complaster. All you need do is to roughen the surface of your saddle, and use the saddle itself as an impression tray with the little complaster on the surface. That is the more accurate and simple plan of refitting the vulcanite plate than is the use of wax or modeling compound. Then you have an impression of the ridge in its relation to the occlusion; invest your cast then in your flask, so that it separates at the juncture of your complaster, coating the complaster with a separating medium, and then separating at that point. Then boil off your complaster, and you have a surface there that you can refit. That is the way to keep up and refit these temporary appliances. Use the gold saddle where absorption has taken place fully, and the vulcanite in this case only because of the difficulty in refitting the gold saddle construction.

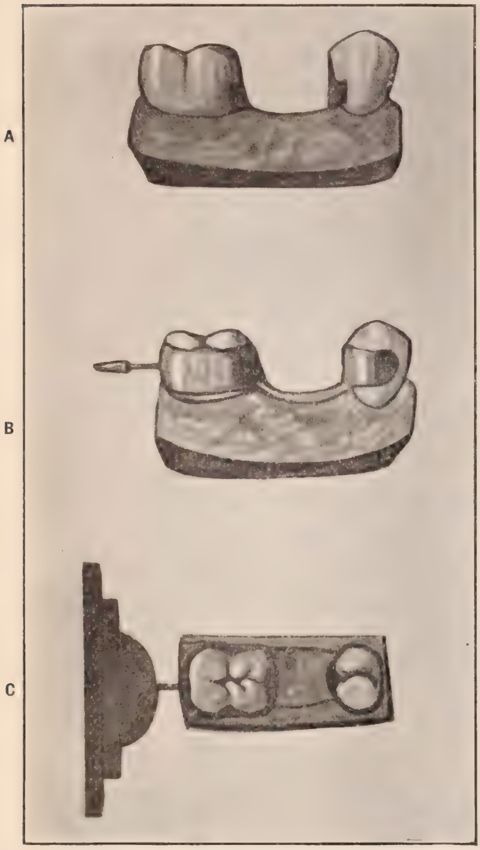

Fig. 6

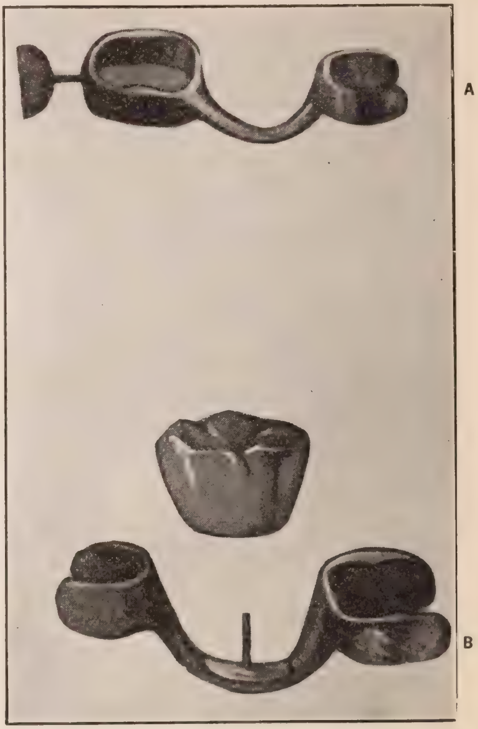

Fig. 7

Fig. 6—a, Showing model with under-cuts filled in; b, wax pattern; c, ready for investing.

Fig. 7—a, Casting; b, casting with excess gold cut off and tooth ready to be cemented to place.

In the assembling and construction of the gold saddle appliances I prefer to make these cases in sections. In the larger saddles, with larger spaces, even though we have double abutment cases—assuming we have a third molar clasp and an attachment of some kind on a cuspid or first bicuspid, we have a space of three or more teeth. If we are making a cast-clasp saddle for those short spaces, one or two teeth, I prefer to cast the entire piece, saddles and both clasps, all in one piece. But in the larger saddles of even the double abutment type, where we have a longer span than one or two teeth, it is preferable to make these in sections. The reason for this differentiation in technic is that in the short saddle case, where we have a short space, we must depend almost solely upon the clasps to carry the load, resist the forces of mastication. The mistake often has been made, in making these small removable appliances, of depending too much upon the saddle for the resistance of the forces of mastication, and that is particularly true in these short spans. If we depend on these narrow small saddles for this resistance, they are not very satisfactory, and they are not comfortable. The patient bites down on it, and it jambs into the gum. Then due to the fact that we have here a short space and we have large accurately-fitting clasps, we have great difficulty in placing these appliances, getting them in and out; we must have more or less parallel. Then it is quite difficult to make these clasps separate, and the saddle separate, and secure the relation of those parts by assembling them as we would in the larger pieces. The saddle is so small that it is difficult to handle it. It is like making a pinhead inlay. The larger the pieces are, many times, the easier it is to make them. If we have a space from a cuspid to the third molar, and a space on the other side of any considerable amount, those are comparatively easy. Then we can work in one side, and sort of lock it in on the other side, and spring the material more or less. But in the shorter appliances

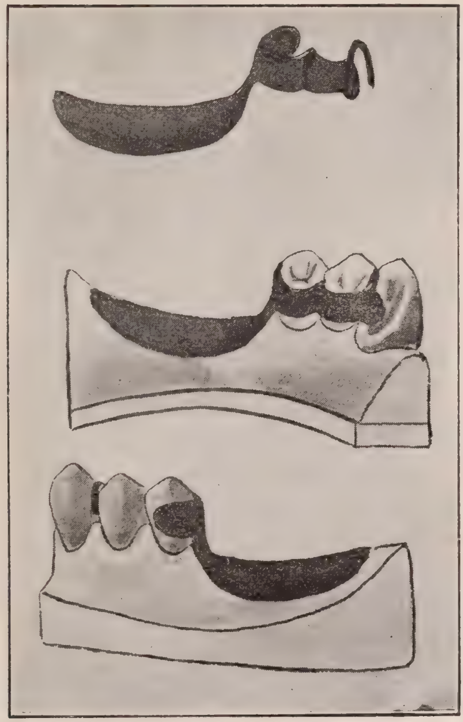

Fig. 8—Unilateral case anchored with double cast clasp and embrasure grip.

they are more rigid and must go to place just so. The accuracy with which these short cases must be made makes it better to cast this in one piece. In the construction of these larger cases, and particularly is it true of the extension saddle cases, it is desirable that we secure a compression of the saddle at the time we are getting an impression of the clasp. We can do that in the larger cases because the saddle is large enough, so that we can use our compression method of pressing the saddle down to place at the time we are taking an impression of the clasp and the saddle, so that we are only really getting an impression of one-half of the saddle at the time we are getting the impression of the clasp. In the larger cases, where it is possible to gain some support of the appliance, it is desirable because of the strain to put some load on the saddle, and with the larger saddles, and particularly with the upper jaw, we follow the plan of assembling these parts in sections.

We take an impression of the alveolar ridge and make our saddle. After we have the clasp and saddle, if it be a double abutment case, it is necessary to assemble the three parts, the two clasps and the saddle, one at a time. We cannot get that impression with the same degree of certainty if we try to do it all at one time, because we must cover our saddle with the impression. We will have our clasp in position. By using a closed-end tray, or you can take a flat piece of metal and bend it around properly, to have the right-angled piece of metal resting so that it will strike the saddle properly, and the right angle will cover the clasp, and the end of the piece of metal should strike the saddle in the middle. If you place it in the center, locating that point before you put the impression material in, you will seat the saddle automatically. Then use a small amount of plaster of Paris in between the right-angled portion and the teeth, just enough to cover the clasp and this end of the saddle, so that we can see the edges of our saddle, and see that the saddle has not been displaced while we are taking our impression. Instead of having an orange-wood stick placed between the antagonizing teeth and the saddle, locating that, and having the patient bite on it, and depending on that for the impression, I prefer to depend on handling those things with my own hands. I place this piece of metal in position, and get hold of it with my thumb and fingers holding the lower jaw, and I am sure of my holding it under a certain pressure. I can see the saddle and I know the pressure is the right amount, and I can maintain it until the material hardens. Then run up the impression compound and solder the two together, and then put it back in the mouth and take an impression of the other end, and we are sure that part of it is right before we go farther. Suppose we have made a slip in the position of the saddle. Stop right there. Do not say, "I will make the correction when the case is finished." It is better to stop right there, saw that in two, if necessary, and try it again. Be sure that step is correct before you take the next. We prove each step as we go.

As to the construction of double abutment short bridge cases, this part of the practice has been much neglected. We see many cases where there is a single tooth out, and one of the most common losses is that of the first molar. You know the damage that occurs to most mouths when there is just one lost during youth. Almost invariably there is disarrangement of the mouth; mal-occlusion, bad contact and decay, pyorrhea and all the other ills of the human mouth come as a result of those conditions. We are responsible for that to a large extent. Of course, if our patients neglect their mouths until the time has come when they must lose these teeth, we are not to blame, but frequently we can prevent the damage in large measure if we handle the situation properly. We have been letting those cases go, feeling that rather than to cut into those teeth, putting in a fixed bridge or inlay, it would be better to let them alone. Too many of those cases have been neglected. We can supply those cases in most instances with removable appliance and cast clasp that will largely eliminate these damages, and in a way that will be satisfactory. The appliances will fit accurately, and will be serviceable and comfortable, and can be worn indefinitely without any damage to the teeth. It is better to make these appliances in one casting. To secure the best possible impression of these cases, a sectional impression is necessary. I prefer to take this impression in sections, rather than take an impression with the ordinary crown and bridge tray that would involve all the surfaces, and then remove the tray and split the impression in two. Of course, we must break out our impression. That is understood. We want an accurate impression of these teeth as they are. We want the condition before us on our model just as it is in the mouth. If we have to eliminate this undercut, why not take the impression in beeswax and first drag out, and then we will have nothing to interfere with its going to place? That is not good, because to take advantage of the contour and extension of the clasp below the bell of the tooth, which gives it its grasp on the tooth, you must have an accurate impression of the relation of these teeth to each other. To get that impression in the most definite way, I find it is better to improvise a tray. Take a piece of aluminum and bend it at right angles to the surface, so as to get an impression of the occlusal surface of the tooth. We can draw that impression out, and we want an exact impression of the occlusal surfaces of this tooth and all of the periphery, and we are anxious to get an exact impression of these proximal and occlusal surfaces; so it is better to predetermine just where your separating line is going to be in your impression. We take this impression in modeling compound or complaster; I prefer complaster, because the modeling compound is tricky and hard to work. You will be more certain of exact impressions by the use of complaster. We cut away the impression to the half-way line. Instead of cutting away our impression to withdraw centrally over the occlusal, we cut it so that it diverges off buccally to the summit of the buccal cusp. That gives us the impression of those surfaces in the one-half. That must be drawn out occluso-lingually; we cannot draw it directly lingually or occlusally. The bell of the tooth will prevent the draw in that direction, and we must draw it according to the conformation of the sections of which we are taking the impressions. If there is too much overlap, and we draw against that, that piece will break off. Draw it down to the separating line, the line that will not interfere with the draw. You should have the occlusal and at least half of the lingual surface of the teeth. Then we are ready to take an impression of the labio-buccal half. We take another tray that will cover the buccal surfaces only. By placing the lingual half back in position with the surface of that previous impression, a surface covered with soap or any separating medium, take the buccal impression. Now you have two sections of the impression, with that separating line predetermined, so that you lift each half of it out, and put it back, and you know you have all the surfaces. You have no imperfections that bring in the element of guess work. Having our impression, all that is necessary is to run up with investment compound as outlined. We cut away any excess we may have, leaving the two teeth we are to clasp. We must eliminate the undercut, but we have the model of the two teeth before us and we have nothing else, and we know that is a reproduction of the conditions as they exist in the mouth. We can determine how much of that undercut there is, and in all these cases we shall have some. We fill in the undercut, and straighten up the proximal surfaces of these teeth in our model with inlay investment compound, in order that that additional inlay investment compound may be built onto this undercut. So that our cast will come off and on readily we must secure that bit of inlay investment compound so that it will stay in its place. We dig back into the model and make a dovetail into the model, and moisten it, and fill in and straighten up this surface. It must extend slightly to lingual and buccal so as to eliminate this contour between the two teeth. There will be a space underneath between the casting and the tooth, restoring in your artificial appliance the interproximal space.

The question is asked, "Isn't that an objection, a place for foreign matter to lodge?" No; it is an advantage. You are eliminating that gingival contact at the point where you should remove contact with your appliance, and you have a restoration to practically normal relations. You have the septum and proximal space there. That is necessary in order to get the cast off and on. This must be mechanically retained. If you just paste that onto your inlay investment compound model and wax it up over a thin piece of inlay investment compound, when you invest your casting and heat it up, that piece is likely to separate under the heat and it will fall out of place; but by placing it so that it will be mechanically held in position, you will have a smooth casting that will require little attention in placing it in the mouth.

We should take advantage of the law of gravity in casting these appliances—and this is a feature I think we should observe in all of our castings. I know it is possible to make castings of all kinds of curly, irregular surfaces and cast gold uphill, but I believe those are more or less trick castings. We can do those things by force, but my experience has taught me that the more simple plan is the more successful one. To take advantage of the law of gravity in casting is an advantage. I prefer to have all parts of my wax pattern below the point of ingress of the molten gold, so that every surface of that pattern is in a line of least resistance, and I have gravity to assist me in getting the gold into place. I am not forcing it down into the bottom part of the mold, and forcing it under pressure against gravity into some other part of the mold. So I carry my wax clear around to the distal side of the molar or bicuspid, making a complete ring of it. The saddle then is suspended. All of the appliance is below the point of ingress. Then we simply trim off the excess, so that we have an open clasp rather than a continuous ring. We take advantage of gravity, having a gateway from the point of the sprue around on both sides, and they are uniformly and easily cast.

The casting process is the least understood of almost anything we do. There are many different methods and kinds of machines. Some of the technic and some of the machinery are complicated. I do not believe there is any necessity for so much complication. I would be willing to take a contest on with the most complicated machinery, and use a tin can lid and a piece of blotting paper. It is as possible with simple methods to get as good castings as with complicated machinery. It is largely a matter of observing and mastering a certain way of doing it. I do not want to disparage any machine or technic, but you can do this work, using the simplest kind of machinery.

Among the most difficult cases we have to deal with in the construction of partial dentures is the unilateral case, where we have all the teeth out, say back of the second of first bicuspid, or the cuspid, on one side of the mouth, and all the teeth in on the other. There are certain conditions that are favorable for what we call the unilateral construction, making the appliance so that it occupies one side of the mouth only, not using the lingual bars in the lower, or palatal bars in the upper.

In this chart we have pictured what we believe is the ideal condition for a unilateral construction, a lower case with the molars all gone, with the first and second bicuspids good, strong teeth, favorable in form for clasps, with a large, well-defined, fully-absorbed alveolar ridge, with at least a normal occlusal relation. The shorter the bite, the better; the larger the ridge, the better, and the more nearly absorbed the ridge, the better.

These are cases most favorable to the unilateral construction. If you have a narrow thin cartilaginous ridge, short and with a lot of mobility, do not put in the unilateral construction. These cases are a bugbear to the prosthetic men. They do not offer any definite support for our appliances, and it is difficult to make those cases so that they will not be a constant source of irritation because of their instability of saddle support. Select your cases for this type of appliance.

The construction of these cases follows practically the technic I have given. I prefer as a rule to make this appliance in sections, remembering that in all extension saddle cases the best results will be obtained if we make the saddle separate and the clasp separate, and then secure the compressed relation of the saddle, and get that relation between the saddle and the clasp so that the saddle, when the appliance is put into its place, will have an accurate and firm bearing upon the ridge. Any time one of these appliances, or any extension saddle case, upper or lower, of the extension saddle type, is put in the mouth, I have a rigid telescoping attachment that grips firmly and securely, and occupies a definite position on the teeth. But if I find that the heel of the plate, upon pressure, or if I put it in place and find that the heel of the plate sets away from the tissue, and I find upon pressure it does not stay down in position in its posterior relation to the ridge, I do not consider that a successful case. You will exert too much leverage upon this tooth if the saddle does not fit accurately on the ridge and you do not have a ridge that is of a nature that will provide the proper support. As a matter of fact, the ridge must carry the major part of the load, and you are depending on the clasp only to hold that appliance securely in position.

In the use of the extension saddle case, or in all saddle cases in the upper, we can take advantage of the extension of our saddles on the palatal side of the ridge, and secure a very material or additional support of the saddle or resistance of the saddle to the masticatory forces by scraping our model, making a relief of the model.

In the gold construction, and that may be said of the vulcanite too, a point we might mention in connection with the vulcanite construction in the upper cases where we do not depend, as a matter of fact, I never depend upon suction, so-called, for the retention of partial dentures; I depend altogether upon the clasp for the retention. It is impossible, in my judgment, to secure coordination between suction and mechanical tense friction or retention. One or the other is doing the work as a rule. If it is a suction plate, depend on suction, and if it is a clasp case, depend on the clasp for retaining the appliance in place.

I extend my saddles well down, covering a much larger area of the palatal side of the ridge, and always scrape it. If it is a vulcanite case, I scrape the model a little beyond what I think is necessary. I want close apposition of the saddle over this area. This area of the mouth is always compressible, and it is a tissue that will stand more pressure without irritation than the buccal surface of the ridge. So by scraping your model here, you can get a closer adaptation of your saddle area, and extend and broaden the saddle, and it will stand a considerable pressure without irritation to the patient, by reason of the fact that you have a thick, tough, spongy surface that will bear the strain, Almost invariably, if your saddle comes in contact with the alveolar ridge on the buccal margin, you have a thin mucus membrane, with the bony structure close, and with the least excessive pressure there will be irritation, and you will have difficulty in relieving it. But on the palatal surface there may be considerable pressure without irritation.

In the construction of extension saddle cases for the upper we always relieve the models and get that apposition. In the vulcanite case, if the pressure is too great, you can dress it off; if it is not enough, it is a difficult matter to change the form. Of course, if you have a long extended flap, you may be able to fit it, but it is difficult. But the gold construction makes possible a nicety of adaptation with a limited amount of material, and is much superior.

In the application of these extension saddle cases and these unilateral cases, we should secure the closest possible adaptation of the saddle to the alveolar ridge, and make that in a way so that the saddle will carry the major part of the load. It would not be a unilateral construction, of course, if we extended the appliance to the other side of the mouth, but it may be a unilateral case because the teeth are out on one side and all in on the other; but if we extend the palatal bar, in the case of the upper, or the lingual bar, in the case of the lower, across to the other side of the mouth, it is a bilateral construction.

In many of these cases we have, in addition to the anchorage we can obtain on the one side to overcome the leverage and lateral strain and torsion on the teeth, to extend across with the lingual bar in the lower, and the palatal bar in the upper, and secure some resistance or prevent this leverage, and we can use this little embrasure hook that I referred to yesterday, by the very slightest of mutilation. If the occlusion is very close, and in many cases it is very close, there is no serious objection to using a knife-edge stone and reducing the surface of the tooth a little, first preferably removing the antagonizing cusp; remove a slight amount of the contact point. That would be my first point of contact, and then if I felt I was going to reach the dentin, I would take a knife-edge stone and cut a small amount on the other side to accommodate this small wire.

I have only in a meager way covered the subject of partial denture construction. It is one of the biggest subjects in dentistry, and never in the history of dentistry were we called upon for better partial denture work then we are today. Let us be careful with this cast-clasp work. Let us select those cases not susceptible to decay, if possible, and then insist upon such care of the appliances that decay will not come. If you observe decay starting, coat the surface with nitrate of silver. It is better to have a black spot than a dead nerve. I want again to ask you to be fair with the cast clasp, and give it a chance. I use it wherever possible. I do not believe in mutilating the teeth for the sole purpose of making some type of clasp or attachment anchorage to them. There are plenty of teeth that require filling and crowning, to which we can fasten our attachments, and where the tooth does require a crown or an inlay, I would prefer in those cases some form of attachment. But we are not justified in mutilating good, sound teeth for the sake of making attachment to them. Let us be conservative, and use the device that will require the least mutilation of the teeth.

Wabash Ave. and Madison St.

THE HIGHER AND BETTER EDUCATION OF THE DENTAL STUDENT*

BY EUGENE S. TALBOT, M.D., CHICAGO, ILLINOIS

THE OBJECT of the formation of this section was to assist in establishing a closer relationship between the mother profession of medicine and the younger specialty of dentistry, and eventually to place the specialty on a medical basis. How much has been accomplished in this direction since its formation, history has shown. Certainly the interest displayed by the ablest men in the medical profession by their presence, in reading and discussing papers, demonstrates that they have done more than their share in placing this section on an equal footing with the other sections in this great Association.

In my early practice of dentistry I soon realized that if I was to become a successful practitioner, I must know more of pathology than I had obtained in the dental school. To obtain that knowledge I must attain a medical education; and although it was a hardship for a man with a family to abandon practice for two years, I have been more than compensated by the broader knowledge and fellowship which I have acquired. Every man starting out in life should have high ideals, and those ideals should be so broad and advanced that it would require a lifetime to accomplish the end.

The ideals firmly fixed in the minds of those men who organized this section were that dentistry, being a part of the healing art, should and must be a part of the medical profession, and that a thorough medical education was just as necessary for treating diseases in the mouth as diseases in any other organ of the body. The dental schools have begun to realize this fact, for since this section was established, the college course has been extended from a two-year to a four-year course, the entire length of a full medical education.

It is rarely the lot of man to live to see his ideals developed to their highest attainments. Nearly all of the organizers of this section have passed on. With one exception, however, they all lived to see great advances along the lines of their ideals.

The stomatologist with his medical education is on an equal footing with the men practicing in every other department of the healing art, and is, therefore, freely consulted in the most difficult and obscure etiologic symptoms of disease in which the mouth, jaws and teeth may possibly be a factor.

As time goes on and the etiology of disease becomes better understood, the relationship of the general practitioner and the stomatologist must become more intimate. It stands to reason, then, that the man who treats the mouth, jaws and teeth must be a medical specialist, equal to the best medical specialist in other branches of the healing art.

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*Chairman's address, read June, 1919, before Section on Stomatology, A. M. A., of which THE DENTAL SUMMARY is the preresentative organ for the dental profession by special arrangement.

It may be of interest to the members present to know that in the thirty-nine years of its existence, this section has not received a single paper on the subject of the mechanics of dentistry. All papers presented and read before the section have been on the subject of pathology or on some subject of interest to both physicians and stomatologists. By adopting this plan, physicians have been as much interested in reading the papers of this as of other sections.

On the other hand, many dentists subscribe for *The Journal* or obtain access to it through physicians in their vicinity. Through this section, therefore, there has developed a closer relationship between medicine and dentistry. The future of this section has a prosperous outlook. Focal infections arising from diseased teeth, and also the associations as a result of the war, have drawn the stomatologist and the medical practitioner into closer relationship. We have arrived at the period when one cannot possibly get on without the other. Physicians are seeking specialists who are qualified to assist them in a proper diagnosis of disease, and naturally associate with those who are medically educated. In the future, therefore, the man who wishes to be a success in his specialty must have a medical training.

The future of the section is assured. Dr. Black comes to us as secretary in the fullness of youth and experience. I am sure that he will direct the future welfare of the section to a higher and broader usefulness.

WOUNDS OF THE FACE AND JAWS

Modern methods of war and its destruction have developed a line of surgery of the face and jaws that could not have been produced in any other way. Injuries due to explosive shells have caused more extensive wounds than can be produced in any other way. These include fractures, destruction of bone structure, and lacerations of the associate soft parts.

We have with us at this meeting stomatologists who have been most active in the different branches of this service and who will demonstrate the latest methods of teaching of the treatment of wounds.

FOCAL INFECTIONS

It has been shown and accurately demonstrated that 95 per cent. of all roots of teeth are imperfectly filled. In other words, owing to irritations in the process of treating and filling the roots of the teeth or to the decomposition of tissue after filling, pathologic changes occur about the roots, as shown by the roentgen-ray and microscope. These pathologic changes have been known to the profession for the past eight or ten years, and yet the same methods of treatment are applied today as formerly. How long would the medical profession continue to perform an operation on any other tissue of the body, knowing that the technic was so faulty?

My researches on animals during the past twelve years,[1] show that the least irritation produced in the treatment of the roots of the teeth will cause absorption of the alveolar process and roots, with irritation and inflammation of the peridental membrane.

Abnormal collateral arterial development in the roots of the teeth and the abnormal development of the granular layer of Tomes—researches of which have not yet been published—demonstrate the almost complete hopelessness of permanent success, no matter how well the root may have been filled.

The number of focal infections and disturbances from faulty root fillings, local and systemic, is appalling. The average dentist, not being grounded in pathology, does not and cannot appreciate the seriousness of his faulty treatment. A different method of root filling must be immediately instituted or devitalized teeth must be extracted. A rule which I have adopted is that a patient's health is worth more than all the natural teeth.

FAULTY METHODS OF PRACTICE

From time to time, in the past thirty years, I have repeatedly called the attention of the profession to the fact that modern dentistry is producing more disease than any other one cause. The profession is beginning to realize the truth of this statement. Since the first dental college was established, there gradually has developed a method of practice of mechanics regardless of pathologic results. The method of practice, at best, has benefited the individual patient only for he time being. On the other hand, after operations are performed, disease has followed in almost every instance.

Our present method of treatment has not benefited the race as a whole. Decay of the teeth and deformities of the jaws have increased from generation to generation until at the present time hardly a child under twelve years of age can be found free from tooth decay and deformities of the teeth and the jaws. Since our present methods of procedure are faulty, we must resort to radical changes in treatment and devote our entire attention to preventive measures.

MEDICAL TEACHING VERSUS DENTAL TEACHING

The wonderful progress made in medical teaching in the last fifteen years should be an incentive for the better education of the dentist. In 1904, there were about one hundred and fifty-six medical schools in this country. Through the influence of the Council on Medical Education the standard has been raised and the number of schools, by combining one with another or by dropping some out altogether, has been reduced in the last fifteen years to eighty-five. From 80 to 95 per cent. of these schools now require for admission two years of work in a college of arts and sciences, as compared with only 2.5 per cent. of all colleges holding that requirement in 1904. In some of the schools there has been a continuous session of the four quarters plan, whereby the student is allowed to select any three quarters of the year that best suit his convenience to complete his yearly term.

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[1] Talbot, E. S.: *Dental Cosmos*, May, 1919

The chairman, Dr. John M. Dodson,[2] in his report asked: "Is there a logical reason why the student should not be allowed to utilize the summer months in full-time medical work in residence and thus complete the present requirement of four sessions in three calendar years, his year of internship in a fourth year, and so enter into active practice a year earlier than has been possible under previous regulations?"

Under the four quarters scheme, seven weeks may be provided for vacations so that attendance on the four quarters is no hardship for the student in good health who desires to avail himself of the privilege.

Dr. N. P. Colwell,[3] in stating the further needs in medical education, said that an improvement still greatly needed in medical schools concerns the methods of clinical instruction of medical students. Students should be enabled to complete most of their didactic courses in the third year, so that most, if not all, of the time of the fourth year may be devoted to clinical courses for groups of about six students each in the hospital wards.

These changes, so necessary in medical schools, are just as necessary in the dental schools. I have advocated these changes in dental teaching for a number of years. Why should a student spend four years in college when he can save a year far easier than the medical student, since only half of his curriculum is given up to didactic teaching and the other half to the mechanics of dentistry? The mechanics of dentistry can very easily be taught in the summer months, and the fundamental principles of medicine and dentistry may be left for the winter months. The curriculum can be so arranged that the student can have from five to seven weeks' vacation, which is from three to five weeks longer than the vacation of the average professional man.

I have held for many years that the dental school could not make a professional man out of the student by the present method of teaching, even if the course should be extended to six or eight years. There are two grades of dental colleges in the United States: those that are an actual part of universities or colleges, and those that are not. Those that are a part of universities have nothing to do with the matriculation of students. Those that are not, have everything to do with the entrance requirements of students. There is an unwritten law among the dental schools that all students entering must be either graduates of a high school or they must successfully pass an examination covering the average high school requirements. The result is that a large percentage of the students entering the dental schools other than those connected with universities or colleges have not an education equal to that of our common schools. It is possible that the dean can explain how these students enter.

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[2] Dodson, J. M.: Problems in Medical Education, *J. A. M. A.* 72: 821 (March 15), 1919.

[3] Colwell, N. P.: Recent Progress and Further Needs in Medical Education, *J. A. M. A.* 72: 822 (March 15) 1919.

Having entered, this uneducated student immediately begins to ascertain what is necessary for graduation. He soon learns that the mechanics of dentistry is the essential thing, since he cannot graduate until he can successfully perform certain operations on the teeth and make artificial dentures. Most of his thought and time is spent along these lines. Courses are pursued in the departments of anatomy, physiology, pathology, bacteriology, chemistry, etc., but are not considered of so much importance, as it is the mechanics of dentistry that counts toward graduation and practice.

The student begins his mechanical training almost as soon as he enters school. The result is that the ignorant young man, following the line of mechanics, on graduation enters practice as a mechanic rather than as a professional man. As I have already stated, by this method of teaching, a six-year or eight-year course would not improve the mentality or standing of the individual in the community.

Again, students entering the dental school from the farm, shop and factory are unmindful of what is required of them when they enter practice. They pay their fee and expect to be qualified to serve the public successfully when they enter practice. They soon learn, however, that a broader knowledge of the essentials of medicine is necessary to cope successfully with the conditions presented by their patients than they had received in their dental training.

The remedy is easy. Make a professional man out of the dentist, as well as a mechanic. Require the student to take one or two years' work in the arts and sciences. This will relieve the dean of the dental school of all responsibility of the preliminary requirements. The first two years of work in the dental school should be given up to didactic teaching. The student should not be permitted to operate on patients or perform mechanical laboratory work until the third year. All or nearly all of the last two years may be given up to the practical side of the specialty. The preliminary training in the laboratory of the academic and premedical courses will give the student all the finger training that is necessary to prepare him for his dental activities.

BOOK READERS

There are about 45,000 dentists in the United States. Out of that number not over 500 buy books relating to their specialty, or read them. The reason for this already has been explained. Dentistry is a part of the healing art. There is no reason why the dentist should not be as well educated as the physician and hold an equal position in the community. It is high time that the profession itself awoke to the situation and demanded better qualified graduates from our dental schools.

UNIVERSITY SCHOOLS

This section has always used its influence on the side of the university schools. Your secretary has made it a point to attend the annual meetings of the Dental Faculties Association of American Universities when possible, and has always been received with much cordiality. He has read and discussed papers relating to the higher and better education of the dentist. I would suggest that the executive committee of this section be made a standing committee to attend the annual meetings when possible and use its influence on behalf of this section to suggest improvements in special teaching and to encourage the teachers in their efforts to place their schools on an equal footing with other departments of the healing art.

31 N. State St.

DISCUSSION

Dr. G. V. I. Brown, Milwaukee: The government has made a radical ruling during this war, distinguishing between the plastic surgeon and the facial surgeon who must have had a medical degree, and the dental oral surgeon who had only the dental degree. The National Dental Association is going to give quite a little consideration to this matter at its next meeting. I think that the question that Dr. Talbot deals with, and the suggestion that he makes in his paper of having an executive committee from this section attend meetings where there is discussion of dental education, representing in a more or less official way this section, is one that is worthy of thought.

Dr. M. I. Schamberg, New York: It becomes an absolute duty on our part, as a section, to take a definite position in the matter of the medical education of the dentist. At no time in the history of dentistry or medicine has it become so apparent to the medical profession, to the lay public, and to those of us who are vitally interested in this special feature, that medical education of the dentist and the complete medical education, is essential. I am convinced that there has been no period in the history of dentistry or medicine, when the opportunity is so favorable for this change. Men who take three or four years of study, which is almost paramount to the course in the medical schools, are entitled to a situation in this world, equal to the graduate of the medical school. It is asking too much of a man to spend that amount of time, and then be looked on as only obtaining partial medical culture. I would merely sound one note of caution in approaching the subject: that we do not put it quite in the way the chairman has. I think probably he might be induced to modify that term— of saying that they can have their mental training during the winter, and mechanical training during the summer, because that is almost a slap at mechanical training, which, after all, must be mental as well as manipulating.

Dr. E. A. Bogue, New York: There is in the dental profession, an idea of lack of recognition by medical men that is pretty general. As soon as our men are prepared the medical profession is prompt to recognize. If it were in the power of this section to encourage the younger men to go through the medical school it would be desirable. I knew pretty intimately Sir John Tomes and J. Smith Turner, who are responsible for the dental law of England; yet, with all the care which was given by them and their friends, the unqualified practitioner in number surpasses the other practitioners in England today. There are many in England to come up to the level which has been formed by our well-qualified men during the war.

Dr. Frederick B. Moorehead, Chicago: One does not need to look far to discover the trouble in dental education. The whole fault lies in the organization of a separate training for dentists. The dentist should receive, in a large measure, the same training as the physician, and dentistry will never be a satisfactory component of medicine until the dentist and physician are on an educational parity. To bring about the necessary change in dental education, it will require several years and must be done by evolutionary rather than devolutionary methods. We face a condition, and not a theory, in the premises. The people must be cared for in the matter of dentistry, and with the increasing knowledge on the part of the layman of the dangers of mouth infections, there is going to be a corresponding increased demand for dental services. To meet this demand more dentists will be needed. It will seem, therefore, that the first responsibility in dental education is not to decrease the output of dentists, but strengthen the dental curriculum to a point which will bring about a change of character in the dental students. We have at present, a four-year curriculum with a high school graduation for admission, and in 1921 the better dental colleges of the country will require one year of college for admission to the dental curriculum. This will necessarily decrease the output of dentists somewhat, and the requirement of one year of college for admission will probably have to stand for a number of years at least before any additional steps can be taken with safety. As soon, therefore, as the supply or demand will warrant, two years of college should be required for admission to the dental curriculum, which will place the dental student and the medical student on a basis of equality. When this step has been reached the first two years in dentistry and medicine may be identical. At the end of this period the dental student may undertake special training, and the medical student may also select his own special field of practice. A degree in medicine should then be conferred on both groups. We have before us an exceedingly difficult task, which must be faced with considerable thought and care. The supply must not be reduced seriously, and at the same time the training of the dentist must be of a different character if he is to functionate as an intelligent part of the medical program. It may be true that the question is too large for any early solution, and that we shall have to arrange for the special training of persons who will practice dentistry from a medical standpoint purely, and continue to train students for the general practice of dentistry as in the past.

DR. W. C. FISHER, New York: We speak of requiring a one year course in college. The Council on Medical Education, in their report, emphasize one great point: That there was one year of the four years in the high school that could be saved; and it was the consensus of opinion of many of the faculties, that the first year in college is almost a wasted year. If you are going to ask one year college education as a requisite of entrance to the dental college, you are asking a man to spend a year almost wastefully because that first year in college is a year of finding oneself. The Council on Medical Education thought that they must stop adding years to the time when a man may take his degree; that the limit has not only been reached, but it has really been passed; that they must now endeavor to go back to the preliminary education, and cut off years from that. This differs distinctly from Dr. Moorehead. If the young man is capable of going to college from high school, he is capable of going to medical or dental college. The medical faculty could exercise over these students the same care in their dental and medical colleges that they obtain in the schools of letters.

DR. ARTHUR D. BLACK, Chicago: I think that no matter from what angle we discuss this question, we must eventually come back to the ground on which Dr. Talbot has stood for all these years, and that is that the education of the dentist must be practically the same in its foundation work as that of the physician. I believe there is no question in the minds of most men who are interested in medical education, but that it would be thoroughly practical to cut out a year somewhere in the high school, or possibly in the grade school, and thereby bring a man up to entrance to the medical school a year earlier. In proposing to do so, we can not overlook the fact that a comparatively small percentage of high school graduates enter college, so that our problem is a side issue with those who are in charge of the elementary schools. I only mention that to emphasize the complexity of the problem that we have before us. In the management of our public schools, educators seem to be gradually coming to the realization that a year cut off for everybody, would be to their advantage, and eventually this may be brought about.

I would like to emphasize what Dr. Moorehead has said of the necessity of this being an evolutionary matter, and to impress the fact that it will take a good many years to accomplish our present objective. Suppose, for example, that the dental schools require one year of college for entrance in 1921, and that possibly in 1925 they require two years of college; that means it will be 1929 before we have our first graduates of a dental school on a parity with the graduates of the medical schools of today. It seems like a long time in advance, and yet that is the very earliest time within which the change can be made. Nevertheless, if we look backward for a period of ten, fifteen or twenty-five years, I think we can not help but realize that we have been making progress in all these years, and we are going to continue.

DR. CHARLES R. TURNER, Philadelphia: I feel that dental education has a present plotted out for itself, the same program that it has ever plotted out for itself. Dental prestige in America came, of course, originally from the development of the mechanical or the manipulative side. It was that, of course, which brought it to the attention of the practitioners of this profession in other parts of the world; in fact, for many years, that was "American dentistry." That is all there is to it; and that very thing has been our undoing. We have hitched our wagon to that thing for too long a time, so that, as we all know perfectly well, we are now beginning to realize that it has blinded us to a proper appreciation of the vital relationships of these things. Now we have within the last few years been paying particular attention to trying to correct that thing, but attaching greater significance to what may be called the vital relationship of dental operations; and it has been along that line that dental education has been working in the last few years. We must remember that the dentist must not only have knowledge, but he must have skill. It is wise for us to bear that phase of the matter in mind, and I must confess that I am disposed to feel that the training of the fingers should start as early as possible.

DR. EUGENE S. TALBOT, Chicago: I brought out in my paper the vital points that we have got to consider immediately, the points that I have stated in the paper have been known from a pathologic point of view for a great many years, and I have occasionally, from time to time, called the attention of the profession to those vital things in pathology, the statement I made more than thirty years ago, that dentistry was producing more pathology than any one cause is beginning now to be recognized. The vital points in this paper have got to be considered right away, for the reason that we are producing more pathology than the patient; that is to say, nearly every operation that is performed in the mouth produces and leaves later in the mouth a pathologic condition. We have got to immediately change our methods of teaching. The whole thing lies in the dental school. We have got to teach pathology, and make mechanics a second consideration.

The Northern Ohio Meeting

The Northern Ohio Meeting at Cleveland, June 7 to 11, marks another notable event in the history of that energetic and very-much-alive organization. Even tho' it is sixty-three years old, it refuses to sit in a corner and watch the procession go by. When men like Hartzell, Howe, Dittmar, Heermans, Henahan, Knapp, Price and the rest get together, something out of the ordinary is sure to happen.

The meeting was a hummer, and it hummed from start to finish, full report in later issue.

The following officers were elected: Joseph P. Henahan, Cleveland, president; J. J. Welker, Toledo, vice-president; J. V. Gentilly, Cleveland, chairman executive committee; Geo. B. Smith, Fremont, secretary.

CORRESPONDENCE

To the Editor of The Dental Summary—Dear Sir:

Within the next few weeks, alumni and friends of St. Louis University throughout the land, will undertake an intensive movement to realize an endowment fund of $3,000,000 for the institution. The fund will commemorate the centenary of the University which passed two years ago without formal recognition because the old school with its sons was busy helping the country win the war.

With the record of a hundred years of service and achievement behind it, St. Louis University faces a future of enlarged possibilities. During the past century the old school has done its work efficiently and constructively; it has labored and sacrificed for the betterment of the public—yet without any general appeal for help.

Now, however, imperative necessity demands that a substantial financial assistance be afforded the University, in order that it may carry on its traditions of high-grade work in the forefront of education. The endowment fund of three million dollars must be raised as soon as is humanly possible. This fund is to be devoted to the increase of salaries for the lay professors and to the expansion and more complete equipment of the different departments of the institution.

Enclosed herewith is a brief sketch of the history of the University and an excerpt from a report showing its immediate and its future needs. Thanking you, I am,

Yours very sincerely,

June 9, 1920.

Julius S. Walsh, *President*,
St. Louis University, St. Louis, Mo.

HISTORICAL SKETCH OF ST. LOUIS UNIVERSITY

More than a century ago when St. Louis was only a struggling frontier town, the St. Louis University had its beginning. In November 1818, three years before Missouri became a State of the Union, the Right Reverend Louis Du Bourg, Bishop of Louisiana, with residence in St. Louis, opened the St. Louis Academy.

Two years later the Academy expanded into the St. Louis College.

In 1823, the members of the Society of Jesus came to Missouri from Whitemarsh, Maryland, crossing the Alleghenies, descending the Ohio in flatboats and arriving in St. Louis from Indiana on foot. Now, at the urgent request of Bishop Rosati, Bishop Du Bourg's successor, they took over the management of the College with the fall session of 1827.

On December 28, 1832, the College was honored by the Missouri State legislature with its charter as a University. A faculty of medicine was established in 1836; a faculty of law in 1843; a faculty of dentistry in 1908 and a faculty of commerce and finance in 1910.

Thus, St. Louis University has nearly all of the principal courses of educational effort. It introduced them into the middle west. It has been the pioneer of education in the west.

NEEDS OF ST. LOUIS UNIVERSITY

IMMEDIATE

$75,000 a year to increase the salaries of its teaching staff—the income of		$1,500,000
as follows:		
Medical and Dental Schools	$60,000	
Law School	10,000	
School of Commerce and Finance	5,000	
School of Medicine (new laboratory, etc.)		250,000
		$1,750,000

FUTURE

Schools of Medicine and Dentistry	$550,000
New Clinics.	
Buildings.	
Institute of Law	100,000
Extension of present buildings and Library facilities.	
School of Commerce and Finance	100,000
New Building for day school.	
College of Arts and Sciences	500,000
Endowment.	
Dormitory.	
New Building for Preparatory School.	
Total	$3,000,000

AS TO DENTAL ASSISTANTS

To the Editor of The Dental Summary—Dear Sir:

Your letter desiring information of dental assistants was received some time ago, and was unable to look after any correspondence at that time so it has just come to light again.

Our graduates have no difficulty in finding positions. In fact, so far they have positions before they get through school. Our great difficulty is in securing enough girls to take the course.

The State Board of Dental Examiners and members of the State Society have asked us to conduct a special course this summer beginning July 5, to meet the demand for hygienists. We have not fully decided yet whether to conduct the class or not, but will do so if we can get a sufficient number to meet the expenses. It will be necessary to have at least fifteen students. From the indications now, we will be able to go ahead with the course. This will be a special intensive course of five months, which will enable them to take the Colorado Board in December. This will probably be the last short course offered, so if you know of any young ladies who are interested in the work of a hygienist, we would be very glad to get their names.

Thanking you for the inquiry and regretting this delay, I remain,

Sincerely yours,

A. W. STARBUCK, *Supt.*,
Colo. College of Dental Surgery.

OBITUARY

Dr. William G. Stevenson

Dr. William G. Stevenson, son of Benjamin and Catherine Stevenson, was born in Blenheim township, Oxford county, Canada, about fifty miles east of London, June 9, 1842, and died in his home in Morenci, June 10, 1920, aged 78 years and one day.

Dr. Stevenson studied dentistry in Canada and after coming to the States worked in Milford and Detroit, moving to Morenci in the spring of 1869. Since that time he practiced his profession continuously with the exception of five years, when the office was under the management of Dr. F. H. Hood.

He was married to Miss Louise Smalley, in Medina village, July 7, 1872.

The deceased was a life member of the Morenci Masonic lodge and served as secretary for several years. In his early life he took an active part in the lodge work. He was also a member of the Star lodge. He had a good knowledge of the theory of music and served as chorister for several years in the M. E. Sunday school and church and also in the Congregational church. His honesty and integrity were never doubted and in the wide circle of his acquaintances his word was as good as gold.

NATIONAL DENTAL ASSOCIATION ANNOUNCEMENTS

STUDY • PUBLISH • RECORD

BOSTON, AUGUST 23-27, 1920

PRELIMINARY PROGRAM, SCIENTIFIC SESSIONS

Tuesday Morning, 9:00 to 11:30.

Operative Dentistry, Materia Medica and Therapeutics.
(Talbot Hall, second floor Mechanics' Building).

Prosthetic Dentistry and Crown and Bridge Work.
(Denture Section—Paul Revere Banquet Hall, second floor Mechanics' Building).
(Crown and Bridge Section—Reception Room, Paul Revere Hall, second floor Mechanics' Building).

Oral Surgery, Exodontia and Anesthesia.
(Lightwell Hall, second floor Mechanics' Building).

Orthodontia and Periodontia.
(Foyer Hall, second floor Mechanics' Building).

Organization, Mouth Hygiene and Public Service.
(Men's Parlor, Paul Revere Hall, second floor Mechanics' Building).

History, Physiology, Pathology, Bateriology and Chemistry.
(Paul Revere Hall, second floor Mechanics' Building).

Tuesday Afternoon, 1:30 to 4:00

Six groups will present unit clinics demonstrating technical points presented in the papers of the morning; three groups will present cavity preparation and gold filling technic, the other three every step in the technic for gold inlays.

Clinics will be held in same rooms occupied for essays during the morning sessions.

The same plan will be followed during Wednesday and Thursday, essays during the morning sessions, clinics and demonstrations during the afternoon. The same subjects will be covered throughout the entire meeting. All meetings are to be held in the rooms designated.

The following essayists and clinicians will have charge of the subjects given above:

J. L. Austin, Chattanooga
Hugh Avary, San Francisco

E. E. Bailey, Denver
Thomas J. Barrett, Worcester, Mass.
E. T. Bell, Minneapolis
W. S. Benedict, Washington
W. E. Beyer, Indianapolis
John F. Biddle, Pittsburg

R. E. Blackwell, Chicago
Robert White Blake, Indianapolis
R. R. Blanchard, Springfield, Ill.
Theodore Blum, New York City
Harold K. Box, Toronto
George P. Brenner, Milwaukee
J. C. Brownlie, Denver
B. Lucien Brun, Baltimore

Russell W. Bunting, Ann Arbor
James K. Burgess, New York City
Harvey J. Burkhardt, Rochester

W. J. Cameron, Des Moines
Dayton Dunbar Campbell, Kansas City
W. J. Chartres, Des Moines
George Wood Clapp, New York City
W. A. Cook, Detroit
Edgar D. Coolidge, Chicago
Ivan R. Cottrell, Rochester
Harold DeWitt Cross, Boston

W. Clyde Davis, Lincoln, Neb.
Martin Dewey, Chicago
G. Walter Dittmar, Chicago

Maj. Jos. D. Eby, Washington
Robert L. Eller, Washington
William H. Elliott, Detroit

C. W. Farrington, Boston
Alfred C. Fones, Rochester
H. E. Friesell, Pittsburg
I. Lester Furnas, Indianapolis

Don M. Gallie, Chicago
Robert R. Gillis, Hammond, Ind.
William A. Gobie, Boston
N. W. Goodman, Los Angeles
Linwood G. Grace, Cleveland
Don M. Graham, Detroit
J. A. Graham, San Francisco
Alfred Gysi, Zurich, Switzerland

Rupert E. Hall, Chicago
Arthur C. Hamm, Denver
Edwin R. Hart, St. Louis
Thomas B. Hartzell, Minneapolis
Isador Hirshfeld, New York City
H. E. Holladay, Kansas City
M. J. Holroyd, Pittsburg
H. J. Horner, Pittsburg
John H. Hospers, Chicago
Clinton C. Howard, Atlanta
Percy R. Howe, Boston
Thaddeus P. Hyatt, New York City

A. LeRoy Johnson, Boston
C. N. Johnson, Chicago

C. Edmund Kells, New York City
C. M. Kennedy, Des Moines
F. A. Keyes, Boston
E. A. Kinley, Boston
De Lan Kinney, New York
K. W. Knapp, Des Moines

Charles Lane, Detroit
W. P. Larson, Minneapolis
John B. LaRue, Mattoon, Ill.
W. F. Lasby, Minneapolis, Minn.
Carl D. Lucas, Indianapolis

Hugh W. MacMillan, Cincinnati
C. W. Marriott, Atlanta
T. W. Maves, Minneapolis
J. O. McCall, Buffalo
W. Clyde McClellan, Kansas City
Rea P. McGee, Pittsburgh
R. D. McIntosh, Joplin, Mo.
Louis Meisburger, Buffalo
John V. Mershon, Philadelphia
Howard C. Miller, Chicago
LeRoy M. S. Miner, Boston
Maj. L. G. Mitchell, Washington
M. H. Mortonson, Milwaukee

L. D. Nathan, Boston
Edwin J. Nestler, Tonifly, N. J.
Ira G. Nichols, Mandan, N. D.
C. A. Nixon, Valparaiso, Ind.
H. R. Norton, Boston

Wallace L. Ohl, Pittsburg
Oren A. Oliver, Nashville
Forest H. Orton, St. Paul
Elbert B. Owen, St. Louis

A. K. Parks, Montgomery, Ala.
Alex H. Patterson, Baltimore
J. D. Patterson, Kansas City
Jos. A. Pollia, San Francisco
Herbert A. Potts, Chicago
Weston A. Price, Cleveland

Howard A. Reid, Cincinnati
Alfred P. Rogers, Boston
Clifford E. Rose, Buffalo

Jules J. Sarrazin, New Orleans
Victor H. Sears, Chicago
Wallace Seccombe, Toronto
S. L. Silverman, Atlanta
W. G. Skillen, Chicago
V. C. Smedley, Denver
Arthur E. Smith, Chicago
D. P. Snyder, Columbus
Claude J. Stansbery, Seattle
Albert H. Stevenson, New York City
Howard T. Stewart, New York City
H. Hayward Street, Washington

Kurt H. Thoma, Boston
George A. Thompson, Chicago
Justin D. Towner, Memphis

William D. Vehe, Minneapolis

Thos. B. Wade, Philadelphia
W. R. J. Wallace, Rochester
A. W. Ward, San Francisco
J. Leon Williams, New York City
W. H. Wright, Pittsburg

SOCIETY·ANNOUNCEMENTS

Psi Omega Fraternity

The Reunion and convention of the National Alumni Chapter of the Psi Omega Fraternity will be held at Cedar Point, July 12, 13 and 14, 1920.

Wisconsin State

The fiftieth annual (Golden Jubilee) meeting of the Wisconsin State Dental Society will be held at Milwaukee, Wisconsin, July 13-14-15, 1920.

Very respectfully,
DR. W. F. FAUST, *Secy.*,
308 North avenue, Milwaukee, Wis.

Announcement

American Dental Library and Museum Association

The next annual meeting of the American Dental Library and Museum Association will be held, August 23, 1920, 3:30 P.M., at the Forsyth Dental Infirmary, Boston, Mass.

At that session the official business will be taken up and a permanent constitution adopted.

All societies, colleges, etc., applying before that time will be included as charter members.

Another session will be held later in the week to suit the convenience of the majority of members, when an interesting program pertaining to library and museum matters will be given.

Dr. Wm. Bebb will present a short paper dealing with methods of building libraries and museums and of conducting same.

Dr. L. Pierce Anthony, *Dental Cosmos*: Advisability of compiling a new dental bibliography, a standard reference list of books on dentistry published throughout the world. The last one compiled in this country was by C. G. Crowley, in 1885.

Dr. B. W. Weinberger: Bibliography of dental periodicals published in the United States and Great Britain.

All those interested are requested to be present.

A. F. ISHAM, *President*,
B. W. WEINBERGER, *Sec'y-Treas.*,
40 East 41st Street, N. Y. C.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

What is the profession going to do for the thousands of new patients certain to be created by the present activity of the lay press in giving out dental information? If appointment books are crowded now, what will they be like this time next year? The question is a very practical one that each dentist must put to himself and find an answer, so far as his own practice is concerned.

Noticed the other day an item in the lay press stating that "hinged sets" of artificial teeth now "run into big money." Somebody kindly rise up and tell me what a "hinged set" of dentures is? Reminds one of the days of Greenwood.

New York dental inspector says he will prosecute complaints of poor service rendered by dentists; also claims of over-charge. If this is to be the next step toward the protection of the public, far greater regard for the ability of such officials will be necessary. If some dentist is to be placed in judgment over the work of his fellow practitioners he must be not only a first-class operator himself, but also a man of sterling integrity and unfailing fairness.

The dental society of Tampa, Fla., has installed a free school clinic.

There should be more joint meetings of dental and medical men. Every time the two get together there is a distinct gain of respect on the part of the medics for their brother practitioners.

I have attended a number of conventions during the past month, and cannot help noting the increase in interest on the part of the profession in its meetings, as well as the most decided increase in the quality of the program offered. President Harry Carr, Indiana, made a most excellent suggestion in his annual address, printed in this number—that members indicate the kind of meeting wanted, and the nature of the program in order that program committees may know something of the taste to which they are supposed to cater. Just now there is nothing whatever to guide the caterer.

Based upon investigation in several cities and rural districts, just about thirty-five per cent. of the people of the U.S.A. use the toothbrush with anything like regularity. In view of this fact we must conclude that Americans start life with the best teeth on earth.

Glen E. Plumb, originator of the vicious "Plumb Plan" of socialising American railways, speaking recently before the convention of the American Federation of Labor, declared that he could not trust his own integrity as a railroad manager under present conditions. I could not trust his integrity nor his intelligence under those or any other conditions. It appears to me that such men fall naturally under one or the other classification—Fools, or Knaves. Fools, if they are honest in their professed beliefs and teachings, knaves if they are not, are simply advocating their specious theories for their own benefit. My own opinion of Plumb is that he knows better, is simply talking to keep himself in the spotlight, and therefore is a demagogue rather than a leader. Of course, the rank and file of the railroad workers endorse his plan, since they see in it immediate personal gain, while they will be well under the sod when the inevitable crash and ruin come.

"Pediadontist" is the latest; it means specialist in children's teeth. But why not say so? Seems to me that American English is quite rich enough without dragging in these bastard Graeco-Latin titles by the heels.

No use getting all "het-up" over this focal infection discussion. So long as humans are individual personalities, just so long will there be no rule that fits each man equally, if at all. I know as well as I can know anything that foci of infection exist in all human bodies; and I believe that human life as we know it in physical form, could not exist at all without them. Without resistance the electric arc could not give light; without resistance, the currents flowing through the human body could not yield life. Unimpeded, both would flow through the universe innocuously, producing nothing. Unresisted, rivers drive no mills; winds turn no wheels; steam drives no ships. When will men begin to read the Word of God in the things they see, and hear, and feel?

Dr. Carr's recommendation that the presidents of state societies attend at least one meeting of each component during each year is one of the most practical I ever have heard. The state society must get into closer touch with its local societies, and this seems a practicable way to do it. In Ohio the state pays for one lecturer each year to appear before each component. If component secretaries did not know this, they should write secretary Chapman about it.

An aching tooth is a sick tooth, and sick teeth never get well. Drum this into the ears of parents and children until they learn to watch for signs of incipient decay in the teeth, and see the dentist before the teeth get sick.

"You cannot make a silk purse out of a sow's ear," no matter how much you may cleanse it and polish it, or do anything else to it on the outside, so long as you cannot alter the internal nature of the thing. This is the only argument that should be necessary to defeat the operation of every known brand of socialism, communism, Bolshevism or whatever in this or any other country. The doctrine of equality, except as to political equality, the equality of opportunity, is as silly as it is harmful, contradicting every law of nature plainly written on every side, even for those having the weakest of myopic vision.

The Indiana Dental College has purchased a four-story building at Pennsylvania and Walnut streets, Indianapolis, and is having extensive improvements made preparatory to the opening of the fall session, October 4th.

Syracuse has opened its second free clinic. Parents who are able will be expected to pay for treatment given their children.

The Tennessee State Dental Society, under the able and genial guidance of president J. L. Austin, finished its three-day 1920 session, at Chattanooga, on May 29, adding its fifty-third successful convention to those that had gone before. Many of those who habitually attend the Tennessee meetings pronounced it the most successful in the history of the state society. The attendance was between three and four hundred, among those present being several who have gained laurels through the work they have done for the benefit of the profession; notably, that sterling old friend of THE SUMMARY, Dr. D. M. Cattell, now of the Vanderbilt staff; while the program was enriched by the able work of such men as Drs. C. J. Lyons, Ann Arbor, Mich., oral surgery; Hart, St. Louis, prosthodontia; Winter, St. Louis, exodontia; Delos L. Hill, Atlanta, economics. Bogle, of Vanderbilt, and Höffer, of Nashville, Towner, of Memphis, and many State dentists.

The retiring officers were: J. L. Austin, president; J. W. Winn, first vice-president; George L. Powers, second vice-president; C. E. Byington, recording secretary; B. H. Johnson, treasurer; Orren A. Oliver, corresponding secretary. The newly-elected officers installed were: J. W. Winn, of Nashville, president; G. L. Powers, Memphis, first vice-president; C. E. Byington, of Chattanooga, secretary, and B. H. Johnson, Nashville, treasurer.

The '21 meeting will be held at Nashville. All papers and discussions will appear as usual, and at an early date, in the pages of THE DENTAL SUMMARY.

Dr. Harvey J. Burkhart, managing director of the Rochester dispensary, was recommended for the Jarvie fellowship medal by the Fellowship committee, New York State Dental Society, at its meeting, May 14th.

Eight Wisconsin cities now have free school clinics.

Judged by the neglect to which most teeth are subjected, they are worth very little; but let a dentist extract the wrong one by mistake, and then "have another look." A dentist is now fighting a twenty thousand dollar damage suit for that very thing.

Paris is now paying a one hundred per cent. advance in price for the ten million teeth she imports annually from the U. S. A. They over there, know something about old H. C. L. as well as we.

Probably a hundred diplomas have been issued to women dental hygienists during this spring and early summer, every one of whom had been offered and accepted satisfactory employment before graduation. This new work opens a field that should be especially attractive to intelligent, earnest young women, and one that demands far more than the supply.

Dr. Edward Butler has been awarded a medal by the Louisville College for excellence of his paper read at graduation last spring.

The University of Rochester, N. Y., is the beneficiary of gifts aggregating ten million dollars, to be used in the founding of a new school of medicine and dentistry. Geo. Eastman, of kodak fame, gave nine million dollars.

Twice as much platinum is used in dentistry as for jewelry.

Our good friend Dr. C. G. Keehn, Ligonier, Ind., was elected a life member Indiana State Society, at the '20 meeting, May 9th.

Perhaps all of our readers do not know that every ounce of gold mined in America last year, cost the producers nearly nine dollars more than the price paid for it at Government price, and that is the reason why relief is sought under a premium or tax law. How much gold would you mine at such a loss? Also, it may not be known that the duty on imported instruments contemplated by Congress would cover only a part of the additional cost of producing those instruments in America. There always are two sides to every question, and one should know both if he would be in position to express an intelligent opinion.

On another page in this issue we print a letter from Dr. Julius S. Walsh, president St. Louis University, together with a brief historical sketch and financial statement.

If our endorsement of this movement to secure needed endowment can add anything to further its success we most freely and heartily give it.

Many of our best men owe their induction into the profession to the efforts of the St. Louis faculty, while others of our foremost practitioners have given of their best to the teaching staff.

We wish to assure Dr. Walsh and confreres that the pages of THE SUMMARY are open to them at any time. We shall gladly publish anything and everything that they care to supply concerning this most worthy effort to put one of our standard universities upon a financial footing that will permit the proper carrying out of work planned.

Dr. S. Griffith Davis, of the research committee of the National Anesthesia Research

Society, advises that the University of Maryland, which several years ago created a separate department of anesthesia and put him in charge with the title of associate professor, has now realized the importance of the work and given him a full professorship. So far as records are available, this is the first professorship of anesthesia to be created in the United States. Dr. Davis ventures to hope that other schools will soon follow the example set by the University of Maryland.

The executive secretary is privileged to announce the addition of two of the most eminent scientists in America to the member-

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Although containing a very small portion of plaster, "Standard" sets as hard as plaster, with a strong tendency toward crystallization, upon which the porosity of every investment material depends.

Unlike most investments, which are soft and chalky after having been heated sufficiently to burn out the wax, "Standard" when set, is harder than any other material for the purpose. **Dealers Everywhere.**

Price, per small can,	$ .65
Large can,	1.25
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ship of the research committee of the National Anesthesia Research Society. These are Dr. Yandel Henderson, of Yale University and Dr. Charles H. Baskerville, of the University of New York City. The society also has received the membership of several distinguished doctors, surgeons, and anesthetists of the Dominion of Canada.

H. C. Macatee, recording secretary of the Medical Society of the District of Columbia, advises that at the May meeting of that organization, the following resolution was adopted:

> Resolved, that the Medical Society of the District of Columbia go on record as in favor of the limitation of the practice of anesthesia to regularly licensed physicians and surgeons, and dentists, and graduate nurses in cases of emergency, or medical students for the purpose of instruction.

Word comes to THE SUMMARY through the western representative of The Ransom & Randolph Co., Mr. D. W. Rydman, that Charles Ray, the famous screen star, has just ordered through the California Dental Supply Co., a complete dental equipment to cost $27,865, to be installed in a specially-arranged office adjoining his private quarters in his studio at Los Angeles, Calif., and that he has employed a dentist at five hundred dollars per week to look after the teeth of his family of four persons; himself, wife, father and mother. And Ray furnishes all materials necessary. Certainly "going some!"

Mr. Rydman reports also that the new hotel being erected, "the Ambassador," is to be fitted with two complete dental offices, for the convenience of guests.

Ohio—Eastern

Martins Ferry, Ohio, May 6.—The Eastern Ohio Dental Society, in convention this afternoon, selected Steubenville for its next meeting and heard an address by H. M. Semans, dean of the dental college at Ohio State University. Wheeling, W. Va., dentists were honor guests. Officers elected follow: President, D. L. B. Peterson, Steubenville; recording secretary, J. K. Hunter, Bridgeport; corresponding secretary, H. A. Smith, Steubenville; treasurer, St. Clair Hasbrouck, Barnesville.

Indiana—Lafayette

Lafayette, Ind., May 7.—The Lafayette Dental Society, composed of the dentists of Lafayette and West Lafayette, met Wednesday evening at the offices of M. E. LeGalley. No active work has been done by the society since the war, and its reorganization was the principal work of the evening. The following officers were elected: W. S. Walters, president; Dr. Miller, vice-president, and D. M. Roth, secretary and treasurer. Meetings will be held the first Wednesday night of each month.

Pennsylvania—State

Reading, Pa., April 28.—Dr. R. H. D. Swing, Philadelphia, was elected president of the Pennsylvania Dental Society, in its session here today. Other officers chosen are: First vice-president, J. F. Biddle, Pittsburgh; second vice-president, W. H. Lowell, Lancaster; recording secretary, W. L. Fickes, Pittsburgh; corresponding secretary, O. J. Specker, Reading; treasurer, A. B. Miller, Kingston.

Alexander H. Patterson, Baltimore, read a paper at this morning's session on "Perfection in Lower Impressions." Norman B. Nesbitt, Boston, spoke this evening on "Cast Clasp Technic in Removable Bridgework." Five progressive clinics were held during the day. This evening's session was devoted to the reading of a paper of "Why Do Root Fillings Fail and Place us Open to Criticism?" by Ewing P. Brady, of St. Louis. The subject was discussed by Herman Prinz, Philadelphia; R. H. Volland, Iowa City, Ia., and J. D. Whiteman, of Mercer, Pa.

New York—Rochester

Rochester, N. Y., May 12.—Members of the Rochester Dental Society met last evening in the last regular session of the winter series, at the Rochester Dental Dispensary. The essayist was Marvin Welcher, whose topic was "Conductive Anesthesia."

These officers were elected: President, John T. McIntee; vice-president, J. J. Scott; secretary, Howard F. Lewis; treasurer, J. Henry Carey; librarian, J. Edward Line; editor, Charles J. P. Pierce.

Massachusetts—State

Boston, May 5.—Owing to the National meeting here in August, the sessions of the state society were limited to one day. A councillors' meeting was held first, transacting the routine business for the soceity. Under the chairmanship of William J. Speers, of Fall River, who is the retiring president of the society, numerous reports were received, officers for the society were elected, and it was voted to hold the next annual meeting in Boston. Financially the society was found to be in a good condition, with a good balance on hand, and a substantial sum invested, and the membership is growing.

Officers for next year were elected as follows: President, Frank P. Simpson, of Pittsfield; vice-presidents, Frank P. Barnard, of Worcester and William Rice, of Boston; secretary, W. Vernon Ryder, of Boston; assistant secretary, Edwin J. McQuillan, of New Bedford; treasurer, Joseph T. Paul, of Boston, and editor, Charles E. Parkhurst, of Boston.

Iowa—State

Cedar Rapids, May 7.—Clinics, lectures, demonstrations and discussions occupied the convention period, and there were nearly seven hundred dentists in attendance at the gathering.

C. N. Booth, of Cedar Rapids, was unanimously elected to the presidency of the organization, for the coming year. Secretary and treasurer of the society, E. S. Smith, of the University of Iowa dental faculty at Iowa City, and Frank Fort, of Fairfield, were re-elected to their respective offices.

The convention delegates named Des Moines, as the place for the next annual meeting of the society.

Get close to people who have done what you are trying to do, and try to absorb the secret of their success. If you do, you'll find it's *work*, mostly. And the rest is work, too.

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Prepared especially for cleaning teeth, it quickly and thoroughly removes infectious deposits and stains, leaving a smooth, unabraided surface, in splendid condition for the final polish. Used by pyorrhea patients at home, for several days prior to instrumentation, it renders the operation of scaling far less difficult for the dentist, and consequently less annoying to the patient.

Excellent for cleaning plates, removable bridges, etc. Should be dispensed to patients for this purpose.

Use it in the laboratory for the final polish of plates and other dentures. Use on the hands with soap, it removes all stains and odors, rendering them surgically clean, a condition that your discriminating patients are sure to appreciate.

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	Carmi Cleaner Powder, small	$ .65
	Carmi Cleaner Powder, large	1.25
	Carmi Cleaner Powder, 3-lb. can	6.00

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THAT "CHICKENICK"

In response to an imperative hurry-up call, I journeyed out to Lafayette, Ind., on June 22d, for the one sole and single purpose of attending the annual Chickenick of the West Central Society, next day at Myron LeGalley's club house "on the Wabash, far away."

And it was some day! Everybody was there, 63 of us, including Walters and "Little Henry," who, as usual, had unique and useful gifts for everybody—lids, this time; and the chickens certainly suffered an ignominious defeat. Contests for sundry and "divers" prizes were tremendously interesting and hotly contested, particularly that one between Drs. Horn, Ross, Schermerhorn, Tibbett, Carter and Kingery, in memory of Auld Lang Syne! It was the event of the day, and was won easily by Dr. Schermerhorn, who emptied his cornucopia in two minutes, flat. Some of the other contestants seemed to lose interest along about the third "lap." Our cartoonist seems to have caught the crowd at a critical moment.

Anyhow, it was a fine day, everybody was happy, even though some few seemed unable to fill that aching void. The fresh red raspberry jam is worthy of special mention, altho only a few had the pleasure of tasting it. Why so selfish? Pass the good things along.

Dental Society Meetitgs

1920

NATIONAL DENTAL ASSOCIATION

August 23-24-25-26-27—Boston.

STATE SOCIETIES

July—New Jersey; 13-14-15, Wisconsin, Milwaukee.

November—18, District of Columbia, George Washington University, Washington, D. C.; Arizona, Phoenix.

December—2-3-4, Ohio, Columbus; 10, Delaware, Wilmington.

Dates to be announced—Arkansas, Little Rock; California State; Louisiana, New Orleans; Montana, Great Falls; Oregon, Portland; Washington, Tacoma.

DEATHS

At Boston, Mass., May 5, Dr. George F. Towle, aged 81.

At Brooklyn, N. Y., May 13, Dr. DeWitt C. Smith. He was born and practiced all his life in the house in which he died.

At Columbus, Ohio, May 2, Dr. Charles A. Eckert, aged 58.

At Dallas, Texas, April 30, Dr. Thomas L. Westerfield, aged 70.

At Pittsburg, Pa., April 29, Dr. Edward Rose, aged 44.

At Minneapolis, Minn., May 17, Dr. D. H. Carpenter. He was prominent in dental society work, and well known throughout his State.

At Columbus, Ohio, May 10, Dr. L. A. King,

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a veteran who had practiced at Henderson, Ky., thirty-five years.

At Long Beach, Calif., May 22, Dr. William M. Condon, of Omaha, Neb., was drowned while bathing, aged 55.

At Lisbon Falls, Me., May 21, Dr. Emery B. Cushing, aged 83.

At Deposit, N. Y., May 20, Dr. W. B. Carpenter, aged 61.

At Fremont, Ohio, May 31, Dr. Harry G. Edgerton, aged 61.

At Brooklyn Heights, N. Y., June 4, Dr. David Salmon Skinner, aged 76.

At Rhinebeck, N. Y., June 2, Dr. Frank Latson, aged 67. He had not practiced for a number of years, being interested in pharmacy.

At Bloomington, Ill., Dr. Thomas Hutchinson Smith, aged 77.

At Philadelphia, June 4, Dr. David D. Smith, former dean of the faculty of the Philadelphia Dental College, aged 81. He had made many contributions to dental literature, and was considered an authority on some branches of the profession.

At Minneapolis, Minn., June 4, Dr. Joseph Oettinger was killed in an automobile accident, aged 52.

Classified Advertisements under this heading, $2.00 each for 60 words or less; additional space, 2 cents per word, single insertion; three insertions or more, special rate on application.

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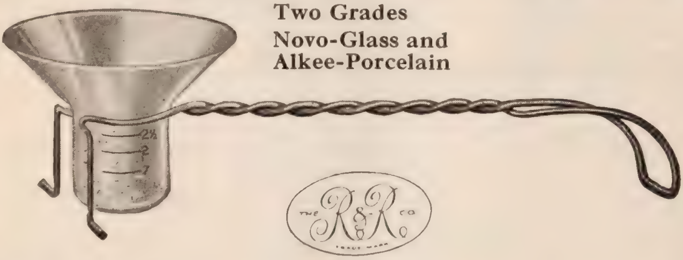

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Well, then, reflect that what applies to the profession applies to the individual dentist.

American Academy

Boston, Mass., May 12.—The American Academy of Dental Science, at its fifty-third annual meeting last night at Young's Hotel, elected the following officers: President, L. M. S. Miner; vice-president, Percy R. Howe; recording secretary, Martin B. Dill; corresponding secretary, Charles G. Pike; treasurer, Charles A. Jameson; librarian, Arthur A. Libby; editor, Horace, L. Howe; executive committee, Edwin N. Kent, John W. Bailey and Amos I. Hadley. Robert H. Clark of Weston, superintendent of the John Hancock Life Insurance Company, delivered an address on "Bolshevism."

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THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL August 1920 No. 8

PHYSICAL FACTORS IN THE RETENTION OF ARTIFICIAL DENTURES*

BY DAYTON DUNBAR CAMPBELL, D.D.S., KANSAS CITY, MO.

SPECIAL LECTURER DENTAL PROSTHESIS, KANSAS CITY WESTERN DENTAL COLLEGE;
FOUNDER AND PRESIDENT OF CAMPBELL SCHOOL OF PROSTHETIC TECHNIC

ARTIFICIAL DENTURES are mechanical substitutes constructed in accordance with the laws of physics in order to replace the lost portions of the masticatory apparatus originally provided by Nature. The retention of artificial dentures is fundamentally a problem of physics, but the problem is complicated through the fact that these dentures are used in the presence of physiological conditions, while the success of this physico-physiological combination is influenced by the psychological attitude of the individual for whom it is designed.

In most cases the problem is purely one of physics and successful results follow the full recognition of the laws of physics. The dentist who knows the principles according to which artificial dentures are retained will be able by a similar process of reasoning to determine what is lacking when retention is lacking.

Atmospheric pressure always has been recognized as an important factor, if not the most important factor, in the retention of artificial dentures. The writer is in accord with those who recognize the importance of this factor but he believes that the actual operation of atmospheric pressure in denture retention has been generally misunderstood, and he wishes to emphasize the importance of this factor in its secondary rather than in its primary effect. Adhesion is another factor whose importance the writer would stress, since, when it is operative most strongly, atmospheric pressure is of less importance; when this force tends to cease then the force of atmospheric pressure is vital to retention.

In this article the writer seeks to develop the following theses: *First,* atmospheric pressure increases in direct ratio to: (a), the area of surface covered; (b), the adaptation of the periphery; (c), the extension on the soft tissues at the posterior border. *Second*, adhesion increases as the surface covered is increased and its force varies with the viscosity of the medium interposed (the saliva). *Third*, leverage is an important factor to be considered among the physical factors in retention.

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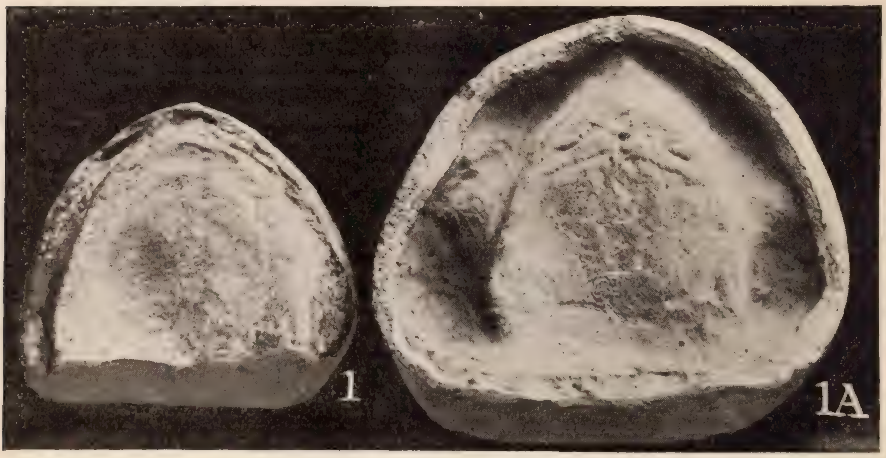
*This is the seventh of a series of twelve articles being written by Dr. Campbell, for the 1920 volume THE DENTAL SUMMARY.

EDITOR'S NOTE: Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

Area—With other factors remaining constant, dentures which cover the larger area will possess a proportionately superior degree of retention, and masticatory efficiency will be correspondingly increased. Of course, this does not mean that the patient with the largest jaw will secure the greatest satisfaction in the wearing of artificial dentures, neither does it signify that in the case of an individual patient the area to which reference is made is that of the maxilla merely. It may be that the area of the maxilla only will be involved but often it is possible to extend the base buccally and labially an eighth or even three-eighths of an inch beyond the maxilla proper. This is often possible and especially desirable in the case of patients with "flat mouths." This added area will sustain added masticatory pressure and will terminate the borders against the lips and cheeks at points most effective in excluding the air. While area is a more pronounced consideration in the upper, the advantages to be gained through availing one's self of this factor in the construction of the lower are certainly not to be lightly regarded. A graphic development of the advantage to be derived from an increase in area is presented in *Figs. 1 and 1a*, which are photographs of the casts of a practical case, and *Figs. 2 and 2a*, which show the bases of this same case outlined and divided into millimeter squares. *Figs. 2 and 2a* cover a surface of 2236 square millimeters and 3736 square millimeters respectively, and while both of these



Figs. 1 and 1a—These figures show casts of the same mouth. Fig. 1a indicates the additional area that has been incorporated since the first denture (constructed on cast shown in Fig. 1) was made.

dentures were constructed for the same patient, the larger shows an increase in area of more than fifty-nine per cent., and a consequent improvement in retention in this same direct proportion. Thousands of dentures that are being worn today are capable of similar enlargement in area and consequent increase in satisfaction to the patients. While it may not be possible to incorporate all of this additional area at one time, it may be accomplished through the construction of two or three sets of dentures during as many years. Owing to the tense condition of the cheeks and lips when the first dentures are constructed, an incorporation of too great area would find this condition operating as a negative factor and serving to tend toward the displacement of the dentures. After the patient has worn the dentures for a few months the lips and

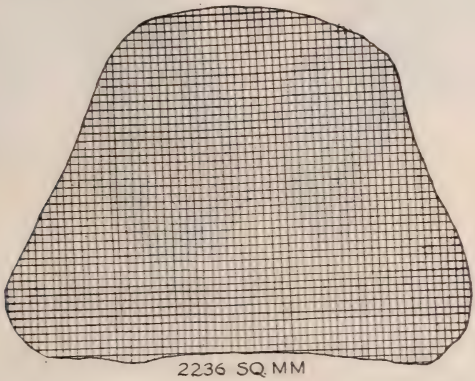


Fig. 2

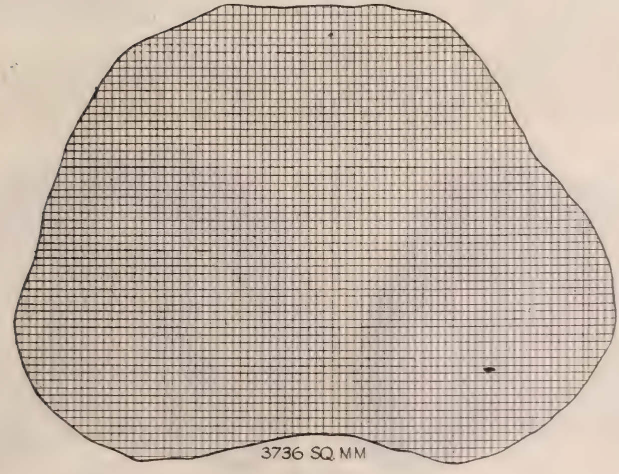
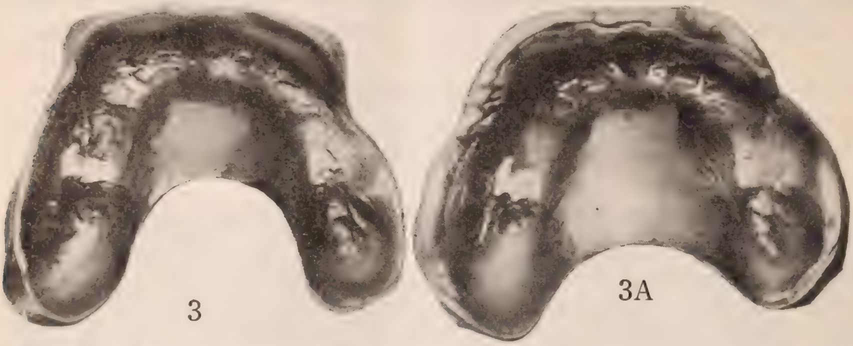


Fig. 2A

Figs. 2 and 2a are outline bases of casts shown in Figs. 1 and 1a. These bases are respectively 2236 millimeters and 3736 millimeters in area. They represent dentures constructed for the same mouth and show an improvement in retention of more than 59 per cent.

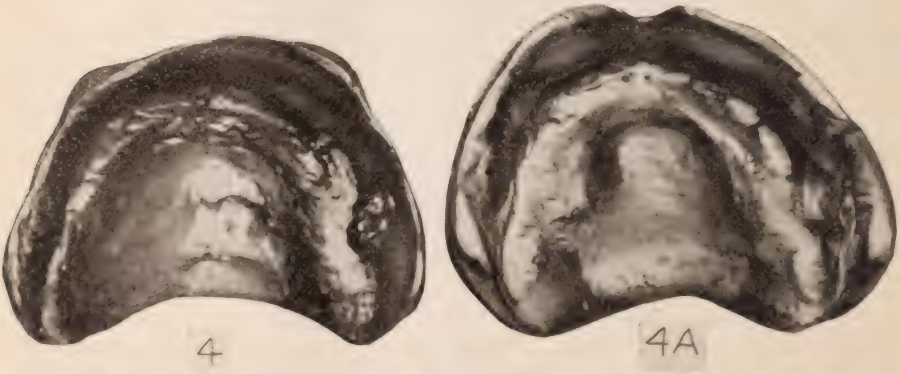
cheeks become more mobile. *Figs. 3 and 4* are photographs of the original gold base dentures constructed for patients, while *Figs. 3a and 4a* are photographs of dentures worn by the same patients respectively at the end of the three years.

"Roofless plates" may be successfully constructed for mouths that have a large area and which possess tissues medium soft at least and in healthy condition. But any degree of success with these will be greatly multiplied in the use of a full-base denture, and, except in the case of a patient obsessed with the ineradicable idea that she is unable to wear anything over the vault, there is no instance in which a full metal base is not more desirable.



Figs. 3 and 3a are contrasted to show added area incorporated in new gold-base denture and extension of palatal portion upon the soft tissues.

Peripheral Adaptation—In using this expression the writer refers to the adaptation along the inner surface of the denture near the buccal and labial flanges and along the posterior border, and signifies that the adaptation here is closer and the compression of the tissues greater than along other surfaces of the denture. The advantages to be gained from a close peripheral adaptation are the ones most likely to be neglected in the process of impression taking, and yet no contribution to success-



Figs. 4 and 4a contrasting original denture constructed for patient with denture worn by same patient three years later. Note area that has been added.

ful retention is more essential. The degree to which the borders of the denture are adapted to the tissues affects directly the degree of atmospheric pressure that will be available.

The modeling compound enthusiast too easily confuses atmospheric pressure in its primary effect as a retentive force, with adaptation. In securing the impression the dentist ofttimes creates a large but very shallow vacuum chamber through pressing the compound firmly to position, often assisted by the lips and cheeks falling over the labial and buccal borders and thus preventing an ingress of air at these points, while it is excluded along the posterior border because the impression material here is slightly imbedded in the soft tissues. This primary condition is analogous to the character of vacuum created by the lad who causes the empty cartridge shell to dangle at the end of his tongue. Both of these instances recommend themselves as splendid examples of the primary effect of atmospheric pressure. This kinetic or active force of atmospheric pressure in retaining artificial dentures and exemplified in the "test impression" often deceives the dentist and misleads the patient, arousing unwarranted expectations in the case of both. The dentist misconstrues this intense vacuum as adaptation even though he may be able to incorporate the vacuum in the finished denture, while the patient is delighted for a few days and gives all of the credit and responsibility for the "success" to the dentist—who also must bear the burden of this "success" when the tissues of the mouth, responding to the law of atmospheric pressure, have filled the vacuum chamber and thus destroyed the "adaptation." The writer does not wish to be regarded as an anti-compound technician, since he believes that a skillful operator may secure final results equal to those obtained by a plaster enthusiast, but he is convinced that owing to the ease with which the compound may deceive the operator, the patient and incidentally the audience, the novice will show himself wise by employing a method which does not permit this unconscious deception.

The dentist, who, employing a Britannia metal tray, fills it with plaster and presses it in mushy condition to position against the vault of the mouth, distending the tissues and filling every available portion of the oral cavity above the lip line, is regularly seized with a similar obsession and delivers himself of ejaculations of pride and gratitude because of the difficulty confronting him when he attempts to remove the mass from the mouth. The affinity of the plaster for moisture has a leeching effect upon the tissues and not seldom may blood be seen upon an impression secured in this manner.

The simplest method of securing peripheral adaptation known to the writer is that employed by Dr. George H. Wilson. Following this method, the operator lines the borders of the Britannia metal tray with beeswax as described in the text-book. The massaging of the cheeks as indicated in the Greene method is for this same purpose but this method requires a very skillful employment of compound at a proper temperature which is determined through a rather extended experience. The writer has found that the employment of black carding wax (without warming) in an individual impression tray as described in the April issue of THE DENTAL SUMMARY, gives the most satisfactory results and for the novice is the most easily mastered.

Extension On The Soft Tissues—Because of the importance of area in retention, the writer is constrained to believe that the base should always be extended too far rather than lose any advantage through restricting its limits. Whenever it is found to impinge unduly the operator may easily trim away the offending portion. If this trimming is done very sparingly and yet very willingly each time the patient appears, it often will result in adding more than a half-inch to the length of a base which the patient thought at first was as long as could be borne—that is, the new base may be that much longer than the old one which the patient has been wearing. Most dentists seem to be very fearful about extending the base sufficiently to take full advantage of this factor. In every instance the base should extend back of the posterior margin of the palatal bones. Consequent upon this effort to extend the base to the end of the palatal bones, the posterior border of the base may often resemble a cupid's bow instead of a straight line or one continuous curve. In fact this is necessarily required when on either side the condition of the soft tissue is such that it tends easily to become irritated. In cases in which the patient will not accommodate himself to the extended base, it is advisable to turn up the extended portion so that it will embed itself in the soft tissues. When this is turned up, the edge, of course, may not be left sharp, but often will be a millimeter and a half in thickness. An extended base will not require to be embedded nor will the tissues tolerate it.

This extension is for the purpose of taking full advantage of the forces of both adhesion and atmospheric pressure. In the act of mastication the denture is retained by adhesion as long as this force is effective; when the stress brought against the anterior portion of the denture tends to displace the denture, the soft palatal portion of tissue adheres longer than the harder portion, and follows the base downward to a point where a vacuum begins to establish itself through the assistance of this soft tissue which acts as a seal against the ingress of air; atmospheric pressure then becomes operative and serves actively to retain the denture. The phase of retention in which the force of adhesion is the primary factor and the phase in which atmospheric pressure is the chief factor, follow each other continuously during the acts of mastication; but the range of displacement and return is so slight that the transition is usually imperceptible to the patient and consequently occurs without annoyance or inconvenience.

Adhesion—Adhesion increases with the increase in area and its retentive force varies with the condition of the saliva. From the standpoint of physics the saliva serves to perfect surface contact and for this purpose abundant saliva of thin and water-like quality is desirable. To insure the presence of a liquid medium in sufficient quantity at the moment of inserting, the operator is accustomed to place the denture in water immediately before insertion. It is obvious that the employment of a medium such as gum tragacanth or some similar preparation containing a sticky substance is for the purpose of retaining the denture primarily through the force of adhesion.

Leverage—Anatomical occlusion is, strictly speaking, a misnomer with reference to the occlusion of artificial dentures, since the artificial teeth, if placed upon the bases in positions corresponding to the exact anatomical positions of the extracted teeth, would in the upper, be placed too far inside of the ridge, while the lowers would be too far outside of the ridge, due to the fact that after the teeth, have been removed the alveolar process resorbs upward and inward in case of the upper and in reverse direction in case of the lower. The occlusion desired is not an exact anatomical reproduction but rather a mechanical arrangement which will serve as an anatomical substitute, or we might designate it as a "mech-anatomical" occlusion. This requires that the upper teeth be inclined outward and the lower teeth inward, so that a line drawn through the long axes of the occluding bicuspids and molars will pass through the crests of both ridges.

In the study of occlusal forces during the process of mastication we may distinguish the force which drives the teeth through the bolus of food from the force which retains the denture in position during the process. The muscles of the jaw constitute the driving power; atmospheric pressure, adhesion and leverage constitute the retaining forces. In the upper, the palatal portion of the denture may be considered the power arm, the alveolar ridges as the fulcrum and the teeth as the work arm, as is easily evident in the act of biting an apple.

In setting up the teeth, retention is aided through setting them as near the crest of the ridge as possible, but too often the esthetic demands conflict with the demand for a perfectly-retained denture, and confronted by this situation the operator decides that a degree of retention must be sacrificed in order to satisfy the esthetics of the case. If it were possible to set the teeth on the lower inside of the crest of the ridge there would be no possibility of the denture tipping. However, the tongue must have ample space and it therefore precludes the physical advantage of such an arrangement.

Finally, it may be permissible to call attention to the substance of the opening paragraph of this article, namely, that the solution of this fundamentally physical problem of retention involves a physiological problem and its solution is influenced by the personal equation of both patient and operator.

WHEN TO EXTRACT AND WHEN TO CONSERVE DISEASED TEETH*

BY THOMAS B. HARTZELL, M.D., D.D.S., MINNEAPOLIS, MINN.

I HAVE BEEN particularly anxious all my life to see things as they are, and see them completely. I know of no greater error into which one may fall in teaching than, through an enthusiasm or a prejudice, or lack of analysis of any subject, seeing only a part of the subject; and no matter whether it be in dentistry, in mechanics, or in medicine, when we tear a little segment of truth out of the context, and fail to get the relationships that should exist, which help to make that bit of truth a part of the whole, we are apt to make very wrong deductions from that portion of truth torn out of the compact body which makes up the whole.

Dentistry has fallen into a very natural error, at least a portion of the members of the dental profession have done so in adopting in some part logic of the following type which I might illustrate by a familiar example: "A cat is an animal and has four legs; therefore every anmal that has four legs is a cat." You tell me a cat has four legs, and I admit your premise, but does it necessarily follow because a cat is an animal and has four legs, that every animal with four legs is a cat? That is the type of reasoning that goes on at present in the minds of the people who adopt the "Hundred per cent. Vitality" slogan. Whenever you wish to arrive at a reasonable, just opinion of any type of science or truth, you want the whole of it and not a part; and I am going to attempt to paint both sides of the whole picture as I see it, in the hope that even the men who make their living by the extraction of teeth will see the justice of the position that I hope dentistry and medicine as a whole will take when the pendulum finally swings back into the position of reasonable judgment.

I suppose I have contributed as much to the "Hundred per cent. Vitality Club" of the country as any one, by giving the profession a glimpse or insight into the very damaging effects of infections that arise from the bacterial- or mold-growths on human teeth. The first paper ever published on the types of infections around apical root ends, was in the *Journal of Am. Med. Association* published by Gilmer and Moody. They recited forty cases in which they had removed teeth and cultured the root ends. I commenced the same line of work one year earlier, and closed it with a paper two weeks later in the same magazine, in which I covered the result of the examination of 162 cases, in which 150 of those root ends yielded positive cultures and twelve were sterile. Then, proceeding from that, we made a study which cost the lives of two hundred or three hundred rabbits, by reason of experimental inoculations made of two types of micro-organisms of hæmolytic streptococcus and non-hæmolytic streptococcus. This work took a year, and necessitated the examination of hundreds of microscopic sections of the tissues of heart, kidney, muscle, brain, nerve trunk, and so on, the result of which examinations you will see in slides which have already been published.

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*A lecture delivered before the Indiana State Dental Association, May, 1920. (Stenographic report by Mark Winchester).

Growing out of the conclusions which came from the study of granuloma around root ends by many men who have contributed to the investigation since, we came to the conclusion that heart, kidney and joint lesions frequently are caused by apical abscesses or granuloma. And further, the X-ray has shown that in many cases the root-canal work of the past has been very faulty; and owing to the fact, that in the beginning I was studying the question of whether or not arthritis arose largely from dentally-conveyed infections, I gathered my specimens largely from sick people in the hospital, and chose those apical infections which were obviously evident in the X-ray to be rather active; so that the first 162 cases showed 150 positive. From that alone many might deduce the general conclusion that all devitalized teeth are dangerous, which would be very wide of the truth, because we gathered our specimens from people who were ill, and we were almost certain when we gathered them that they were infected, from the evident amount of destruction around the root ends.

Growing out of that study there developed a rather positive knowledge that we could produce experimental heart, kidney, joint and nerve trunk lesions and eye injuries, and a great category of things that it is not necessary to discuss now. The fact that the Bureau of Census publishes the death rates from heart and kidney diseases particularly, and shows that heart diseases, endo- and myocarditis, destroy about 150 people out of every 100,000 at the present time, or about 175,000 per year in a population of 110,000,000, indicates the importance of its study. And the general feeling amongst pathologists of the country that the most of the endo- and myocarditis lesions, probably two-thirds, are of streptococcal origin, lends comfort to the man who says: "I will extract every dead tooth I find in the jaw," failing to recognize the fact that apical infection is a comparatively small part of the infection to which the body may be subject; failing to recognize the fact that the human intestine is about thirty-two feet long, and is full of bacterial growth from the cradle to the grave; failing to recognize the fact that in leaving pyorrheal teeth, untouched, if you have a quarter-inch pyorrheal pocket around each of the teeth, you have a cumulative surface of eight or nine inches of infected ulcer; failing to recognize the fact that gall bladder infection may exist for twenty or thirty years before it becomes so bad that the patient must be operated upon; failing to recognize that many of those individuals who yield to streptococcal infections have that slow cholecystitis of years' standing. The body of the kidney becomes infected slowly, producing Bright's disease only after many years. We have examined recently twelve hundred pairs of human kidneys, in our search for the whole truth.

The tonsils, too, are almost always the site of some streptococcal growth. Do you suppose, even if you do have one or two granulomata, that it is fair to charge all the ills that might arise from streptococcal invasion to those one or two, especially in view of the fact that you have thirty-two feet of infected intestine, possibly infected tonsils, possibly a cholecystitis, an old endocarditis or nephritis, or a septic purpura? Why not take *everything* into consideration when you make up your mind whether or not you are going to extract teeth?

Do you know that in the neighborhood of forty-three per cent. of all the teeth that have cavities have infected pulps? I believe it to be true. We have recently examined 125 vital pulps*

I am of the opinion that the average man among us does not take kindly the articles in which there appear tabulations. We turn over the pages of the journal until we come to the picture of a piece of bridge work, or a new device for attaching a plate, or a story of the sinfulness of sin. Even that little time necessary for "future reference" is never given. If you happen to have a spare moment, you play golf or billiards, or go home to play with the babies, or work in your flower beds, or something else. The dental profession never takes much time to examine into the results of painstaking work which results in tabulations. Your executive committee wrote me, when arranging for this visit, "We hope you won't present statistics!"

How are we going to get at an audience unless we give them some sort of mechanism by which they can grasp facts? If you are going to shut your minds studiously to the evidence, even though you have talents, you are going to be on the Last Day, in the position of the Unworthy Servant to whom the Lord gave the one talent, and who hid the talent in the ground, where it failed to yield an increase. You chaps who won't receive evidence really deserve to have the one talent removed from your possession, and I believe you will have it taken away.

In the future, whenever you are confronted with a case in which you find devitalized teeth, take the whole of the evidence in that case or in a series of cases, as far as you can; collect it, collate it, and when you have gathered that evidence all together and placed it before you in some form that you can readily grasp the lessons taught by it, sincerely compare them; and if you determine, after having examined that evidence, that the individual in question should have a few or all of his teeth removed, conscientiously do it; but if you find that the evidence shows no special crime attached to the devitalized teeth, leave them in position.

Would any single one of you willingly go to a surgeon who had the reputation of operating on every patient who came into his clutches, provided he could get the patient to lie still long enough? Would you

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*Reprinted from *The Journal of Dental Research*, Vol. 1, No. 4, December, 1919. (The Bacteriology of Vital Pulps).

not prefer going to a man that you knew would faithfully endeavor to ascertain whether or not an operation really were needed? If it were a dear member of your family, I know you would prefer to trust your dear one to the judgment of the latter type of man.

The general public is rapidly becoming much better able to judge us than in years gone by. Information in regard to diagnosis, etiology and disease is being disseminated from every center of health interest in this country. The government is disseminating it, and the states; and the more public-spirited physicians and dentists are earnestly spending much of their valuable time in educating the public; and the public is learning to discriminate between sane judgment and the lack of it. I know of nothing more damning, more certainly destructive to an honorable and useful position in society, than for a man to gain for himself the name of being an illy-balanced counsellor.

Dentistry unquestionably is attaining a place in medicine which never will be wrested from her, *providing* she endeavor to use *pure judgment,* and not prejudice nor imagination; and the question whether diseased teeth should be extracted or not should rest on a *careful examination* of the *clinical* history, the *personal* history, the *X-ray examination* of the whole body, and particularly of the mouth and jaws; the examination of the *blood-stream,* hæmanalysis, and an analysis of the urine, to know whether or not you are dealing with a nephritic. The blood-stream gives us the best evidence of one's resistance and ability to cope with infection; and, whenever you consider the matter of destroying the human masticating mechanism, you should weigh with the conditions of pathology that you may find, the further knowledge or evidence of *how much damage you are going to do the nutritive mechanism.* You should remember that every grain of food which is consumed to be translated into human energy must be masticated and digested if it is to serve its purpose. You should remember that when you compel a patient to ingest food without having masticated it and thoroughly mixed it with saliva, you have robbed him of the most valuable part of the digestive process, and thrown a burden on the stomach that it often can ill afford to bear, thus creating conditions worse than those you seek to remove by extraction.

Far be it from me to condemn the man who removes a badly-infected tooth. I do not advocate the retention in the human jaw of teeth carrying infection into the blood-stream. I remove them. A patient came to me six weeks ago with a pulse of 110 to 120, sometimes 130; a low blood-pressure, indicating a weakened heart action, evidently a myocarditis. The patient had quite a number of teeth in the jaws. There were pyorrhea pockets around many of them, and in a nearby clinic the advice to go home and have all the teeth removed had been given as conclusive. The patient had all the teeth on one side back from the cuspid removed, and got so much *worse* that the family became alarmed about the lady's life. I examined the patient, found the low blood-pressure, the rapid pulse. She was then running a temperature of ninety-nine and one-half to one hundred from day to day. I found that she had almost a normal hæmoglobin. I found she had 4,500,000 red cells to the cubic centimeter, which is within 500,000 of normal—a comparatively innocuous anemia. I found she had leucopenia, or poverty of leucocytes. The only way to build up that woman's heart muscle was through proper feeding and resting that muscle. I found the mouth to contain a few devitalized teeth, but *none* of them presented apical abscesses or granulomata. The roots were faultily filled, and there were around the root ends those areas that one ordinarily might interpret as granulomatous areas. Could I have been justified in ripping out the balance of that mechanism, leaving that woman incapable of nourshing herself normally during the period when she should have been resting in bed, resting and building up her heart muscle? I did not believe I was so justified; and instead of extracting those devitalized teeth, I gave her digitalis, the infusion. I gave her an ounce at a dose, soon cut it down to half an ounce, and then to a drachm, three times a day. That quiets and strengthens the heart beat; and, if the patient is kept at rest and is well fed, the heart muscle soon begins to recuperate and repair itself.

I had the pleasure of seeing that patient regain an almost normal heart action before she left me to go to a Southern city. If she hurried, the speed of the heart would leap up, but it was running, regularly, from seventy-two to seventy-eight per minute, and the digitalis had been cut off. That repair came by reason of the fact that we fed her to the limit. We took pains that she chewed every grain of food she ingested until it was liquid, relieving the stomach of the tremendous loss of energy caused by churning lumps of food over and over in the effort at digestion until finally the pepsin and hydrochloric acid succeeded in breaking them up and changing them into chyme and chyle, which the patient could absorb and convert into real food. If I had removed those teeth, the patient would be in bed today and probably would remain there and repair never have been accomplished.

Very frequently patients of that sort grow steadily worse and eventually die. There was an opportunity to exercise judgment very much at variance with the individual who says, "Here are some dead teeth. Hartzell says these teeth are infected. Out with them!" Men who render such decisions based upon any teaching of mine have not considered the context. They have taken in only a small portion of the truth on that proposition, and have acted in a prejudiced manner on that small portion of truth. The context tells you to examine the *whole body*, and to *know* the disease from which your patient is suffering; and if it is a disease of the type I have just described, you are doing that patient a positive damage to go into surgery at a time when the heart and the nervous and intestinal mechanisms demand the opposite of ruthless extraction.

About two years ago a man of wide influence in the state of Dakota was brought to my office by his dentist with a myocarditis that had so weakened him that he could not walk over half a block without sitting down to rest. His mouth presented many devitalized teeth, and as I felt convinced that his only hope lay in the removal of those teeth, I proceeded to take them out. I told him what I supposed to be the trouble, and why he had myocarditis, and that the removal of those teeth was necessary before any recovery could be expected. I told him that if I attempted to remove them all at once, he probably would be very ill, if not lose his life. He accepted my suggestion, and we commenced removing the teeth, one or two at a time. At the end of two months we had all but three out, and he had gained in heart strength so that he could walk half a mile, and felt well; and he was determined upon going back to his business in spite of my urgent request that he abstain from much expenditure of energy until we had finished with the case. One day he came into my office by appointment, having three devitalized teeth yet in his mouth, and giving evidence of the very fine improvement mentioned. He said: "Hartzell, I am getting tired to death of not having anything to chew with. I think I could bear to have these three taken out today." I said, "All right; I will remove them; but I want you to promise me that you will go back to the hotel and stay in bed at least twenty-four hours." He said: "All right." I removed them. I went over to the hotel at the close of the day, and was told that he had checked out. The next day I had a telegram from his home town in Dakota stating that he was dead. He had sunk down while addressing a religious meeting, and never had regained consciousness. I had removed three teeth, and had thereby sprayed a shower of bacteria into his blood-stream. Instead of going to bed and resting until the leucocytic body had cleared up that infection, he got on a train, went back home, overtaxed himself, pumped that poison through the whole system, and died of heart failure.

I believe this man would be alive today if he had followed my plain directions. The trouble was, as it so often is, that he was improving so rapidly that he felt better than he really was, as usually is the case, because the revival of recuperative energy always precedes repair. The most successful physician always is the best nurse. He compels his patients to remain quiet until repairs are complete.

We as dentists need to study the grave diseases that are caused by these infections. I have stimulated the formation of study clubs for the purpose of mastering physical diagnosis, and of getting a first-hand acquaintance with the diseases that interlock with dental infections. You should know everything to be known about myocarditis, endocarditis, nephritis and arthritis. You can get it if you choose to take up the study, and you would find the interest in it growing upon you. If you could form judgments that would be just to your patients, then you could handle these cases intelligently and render correct service.

You say to me, "I have been extracting teeth in great numbers all my life and never had anything of that kind to happen." *How do you* *know?* How many of you, having a death following extraction, ever attribute that death to the extraction? Death does not always occur right away. How many are able to trace every case to see what happens?

I once was called into consultation on a patient who had a nephritis, and there was a bad condition of dental mechanism—pus flowing freely and teeth loose; and it was obvious that those teeth should be removed. My friend said: "I will give the ether; and you take out the teeth." We proceeded with the operation, and the third day afterward the patient died. I know I created an intense nephritis, an acute condition, and the patient died of uremic poisoning. If we had taken out one tooth, and waited until the bacteria had been destroyed by the leucocytic body, and then another one, and so on, we would have worked out the toxins gradually, and the patient would have lived out her full term of years. I did not know that I had killed her until years afterwards; but I remembered all the circumstances, and as my judgment grew and I became more able to see things in their true light and *as they really were,* I recognized that that patient lost her life through my poor judgment based upon incomplete knowledge of conditions existing in her case. When I began dimly to see what I believed to be the truth about it, I began to make complete diagnoses, and to so apply my remedial measures that I could make my patients better, instead of taking a chance with their lives. I now want to know *all* the truth, not a small segment of it; for I have well learned the truth of the old saying: "A little knowledge is a dangerous thing."

The man in general practice who does not deal with sick people in the main, does not see this type of case often enough to form clear judgments, *unless* he is looking for them. If he has been educated to make crowns and bridges and do other dental repair merely, and a patient comes into his office, he sees only the part that requires attention, only the mouth and the buccal apparatus, and usually only a small part of that; and the patient goes away and dies a few days or a few weeks after the service. He doesn't take any blame on himself. Ignorance in that case is bliss. But if the ignorance is realized later, the new vision brings self-condemnation and sadness; and to the honest man who shortens a life, it means internal sadness and real sorrow, and an ache that goes with him through life. *The fact that he did it ignorantly does not make it any the less true that those lives are gone, shortened through his ignorance.* That is the condition that I seek to remedy. I want to save you that ache. So I plead with you, even though you make your living by extracting teeth, that you will stay your hand, and *really* examine all cases, and know of your own knowledge whether or not teeth should be extracted.

There are two sides to this question, one the side you have been stimulated to see, since we have come to this knowledge of the severe and sometimes deadly effect of infections that find their way into the blood stream slowly through lesions about the teeth; it has embarrassed us all, and we want sincerely to act upon this new knowledge in order to remedy the ills shown in many cases to exist; but there is danger that we have very great need to study the *other* side in order not to do harm when we intend to do good.

I am an advocate of an even, sane, balanced judgment. I am not a "hundred per cent. man," nor am I one who condemns the practitioner who takes out devitalized teeth *when* they ought to come out. We should be able to form an accurate judgment, and act on it in such a way that the patient will be benefited, and the dentist be able to say, "I have done the thing I should want to have done if I had been the one seeking advice rather than the one giving it."

I am neither for nor against extraction *in toto.* When a physician sends a patient to you with the demand that you do some certain thing, you should use your own best judgment; and if that judgment demands that what the physician orders be not done, you *should not* carry out his demands, until he can *show you* that your judgment is incorrect, and that his demand is justified by the best results in *service* to the patient. I thank you.

DISCUSSION

QUESTION: Is iritis usually of streptococcal origin, or may it result from venereal origin occasionally?

DR. HARTZELL: Iritis is very often due to gonorrheal infection. It is very readily recognized both by microscopic examination and by its clinical picture. Chronic iritis often is due to syphilis. Poynton and Paine, of London created experimental iritis in rabbits in 1914. Since that time I have paid particular attention to it, and have recognized fifty cases. The Wassermann should be resorted to in these cases. It is seldom that patients suffer from one thing alone. They show two or three different types of lesion, and that is why you should determine from what one or more the patient is suffering. If you have a patient with one or two chronic types of lesion, and you promise to cure him by extraction or anything else, you are running a grave risk.

QUESTION: Contrast treatment of case of leucopenia and slight anemia, with twenty-five thousand leucocyte count, with normal red cell count.

DR. HARTZELL: The finding of as many as twenty-five thousand leucocytes in the blood stream is probable evidence that the patient is suffering a deep and damaging infection of some type.

QUESTION: Is root resection generally advisable?

DR. HARTZELL: No, sir; it is not. I do dozens where I used to do hundreds. Root resection never should be done unless you are positive that the root tissue is sterile and the gingival attachment perfect, because if it is infected it will replant in the site from which you have cut the root and curetted. And if the gingival margin is broken, and the patient is growing a coat of bacterial mold on neck of the tooth, it will infect the granulomatous area again. I do not think you ever should.amputate teeth in pyorrhetic mouths.

QUESTION: How long does it take patient to recover from arthritis after operation?

DR. HARTZELL: Many of them never recover. You will not have fifty per cent. of cures, and you will be lucky if you have twenty-five per cent., because most of these arthritic cases have two or three other infections running with them. Many are tubercular. Don't make promises on arthritis.

QUESTION: In cases of recovery in arthritis, is recovery permanent?

DR. HARTZELL: If the dental lesion is the sole source, you will have a permanent recovery. If you have removed the sole and only source by your dental treatment, you will not have recurrence unless new sources of infection have arisen in the meantime.

QUESTION: Detail your method of extraction and removal of granuloma.

DR. HARTZELL: I am out of sympathy with alveolectomy, because the patient has a right to expect that when his teeth are removed you will provide him with a dental mechanism that will enable him to masticate his food; and when you try to rid the mouth of infective areas by chiseling away everything between the clavicle and the eyebrows, you do not leave a very good foundation for the prosthetic man! When I remove granulomatous teeth I generally use novocain, and wait until the bleeding ceases; then curette everything out of the socket and out of the expanded area that the granuloma has created; I reflect the light into the area and actually see that I have it all; and if bleeding continues I use hot packs and other methods of checking the flow until I can see that all the infected and connective tissue has been removed, and I "tent" that until Nature builds a good healthy coat of granulation tissue into that socket. I do not pack it with gauze; I just "tent" it with the gauze.

QUESTION: Would you resect where a granuloma is present which is giving no apparent trouble?

DR. HARTZELL: That would depend on the condition of the patient. If I could assure myself that the root was sterile inside of the root-filling area, and the gingival margin perfect, I think I would. If I thought the patient was in a condition that did not justify surgical interference, I might for a time let it pass; but I would make a record of it and keep close watch of the patient. If everything went along, I might let him carry that handicap for a while, but I would make a record of it and write him a note telling him what I thought of the condition and of the danger, and the advantage of leaving it for the time being.

QUESTION: If you were suffering from any chronic physical condition, at this time considered a sequela of subacute infection, would you favorably consider the removal of your pulpless teeth, no rarefaction being evident; or would you consider it expedient and wise to retain the teeth?

DR. HARTZELL: I would retain the teeth. I had some casts and albumen myself some years ago, and I had two devilatized teeth at that time, and I still have them.

QUESTION: What is your opinion of curettage of sockets of pulpless teeth?

DR. HARTZELL: I always curette and almost always "tent." That is not as pleasant for the patient as to have the blood clot form and have it heal, but it is better.

QUESTION: Please explain why broth culture, positive, injected into rabbit in one case produced death, while in another case organisms from pulpless teeth produced death. Do you mean to say the organisms were of the same strain?

DR. HARTZELL: Probably not the same strain. There are many families of streptococci. We find we can take virulent organisms and grow them on a medium inimical to their growth, and produce non-toxic organisms. We can take non-toxic organisms and place them on certain media, and make them death-dealing.

QUESTION: What percentage of streptococcic and staphylococcic infections did your cultures show?

DR. HARTZELL: I do not know that I can answer that accurately, because I do not remember. In granuloma, streptococci occur almost universally, and the staphylococcus seldom. The staphylococcus that grows in any plaque may create pus. The streptococci of the non-hæmolitic type almost never creates pus unless it has been activated by growing under very favorable conditions. You cannot have a staphylococcal infection long without suffering a lot from it. The swollen face is a staphylococcal condition.

QUESTION: Referring to the case of carcinoma of antrum, how could that dentist have made a different diagnosis than he did?

DR. HARTZELL: He could have looked into the antrum and seen that it had a mass of solid growth in it. If you find solid growth, granulating in character, you had best assume that to be malignant, and you should get a bit of it out and have it examined under the microscope, as I did in this case. If you think this may be an operable condition, have everything ready to complete a major operation at that time, because every time you disturb a carcinoma with a knife, no matter how small the disturbance, you run the risk of setting loose carcinoma cells that will plant themselves in other parts of the body. Bacteriologists use the freezing microtome, and the diagnosis comes back in five or ten minutes, and the surgeon goes on and completes the operation, guarding the patient from the diffusion of an operation today to find out, and an operation tomorrow to remove. The major operation should be done within ten minutes of the time when the wound is touched. Many a woman has lost her life because she goes to a physician, and there is a little lump in her breast, and he takes it for granted it is a fibroid, and he takes it out. The wound heals, and then three or four months afterward she finds other lumps, and goes to a good surgeon, and he finds it has been scattered, and that nothing can be done.

QUESTION: With dentally-induced infection, lesions of nerve trunk, what is prognosis after removal of foci of infection?

DR. HARTZELL: The prognosis is good, but the result slow in arriving, because the patient who suffers streptococcal invasion and has a reduced leucocyte count and anemia with it, must be built up before the blood will clear the secondary lesion. The patient should be put to bed, and fed the most nutritious things possible, and given the maximum of rest and minimum of exercise. These cases take a long time, but most of them eventually repair.

QUESTION: What should we say to the physician who demands extraction of all bad-looking teeth?

DR. HARTZELL: I feel like telling him to go to ———! Actually I do not, because I do not care to sacrifice his business if I can save it! I give him enough evidence that I know what I am about, so he doesn't require me to do it.

EXTRACTION OF FRACTURED ROOTS OF SUPERIOR MOLAR TEETH AND RECOVERY OF ROOTS FORCED INTO MAXILLAR SINUS*

BY HUGH W. MAC MILLAN, D.D.S., CINCINNATI, OHIO

ONE THING that has been accomplished by the "teeth as foci of infection" theory is the explosion of the old alibi that broken-off roots would "never give trouble" and that "they would work out in a few days." Modern dental oral surgery demands that all portions of the condemned tooth be removed, and that the surrounding area be properly curetted and drained, more especially if the root remnants and infected areas are in the region of such important structures as the inferior dental canal, nasal fossæ and antra.

The maxillary antrum is the largest of the pneumatic cavities and is located in the body of the superior maxillary above the molar teeth and usually the second bicuspid. It is a hollow cavity and communicates with the middle meatus through the hiatus semilunaris. The floor of the antrum varies. It usually dips down between the buccal and lingual roots of the molars thereby producing ridges in the floor. In some specimens the roots of the teeth extend into the cavity. In other specimens the floor is smooth and sections show that even the tips of the roots do not enter the inferior or alveolar wall of the antrum.

With the roots of the teeth in such close proximity to the antrum, it follows that this cavity will be influenced to a greater or less degree by the diseases of the teeth in relation to it. Infected teeth may discharge directly into the antrum and complicate the recovery when the supposition is that the antral disease is of nasal origin. Such cases are easy for the dentist to diagnose and readily corrected. The most baffling cases are the chronic antra which are curetted and drained in the usual manner and do not heal up. *In some cases X-rays have shown root fragments around which abscess areas have developed and discharged directly into the antrum without giving any indication of their presence in the mouth.* These conditions call for the closest cooperation between dentist and rhinologist. These patients could be saved months of treatment, inconvenience and suffering if the root remnants had been thoroughly removed at the time of the attempted extraction.

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*An illustrated talk before the Ohio State Dental Society, Dec., 1919.

It is the practice of the best rhinologists to have dental examinations made of each patient having an infected antrum especially if there is history of long standing trouble. Similarly it is the duty of the dentist, when he is requested to treat or extract teeth in the region of the antrum to question the patient in order to find out if he has had a history of antrum trouble. The diagnosis can be facilitated by transillumination in a dark room, using a special high-power, one hundred and ten volt light directly off the street current. The small lights from switch boards are not satisfactory as the intensity of the light is not sufficient to pass through heavy bone and produce plainly the diagnostic pupillary reflexes. An inquiry of this kind often will prevent groundless criticism when the curette removes the granuloma and infected bone in the floor of the sinus allowing the patient to pass air and water through the nose.

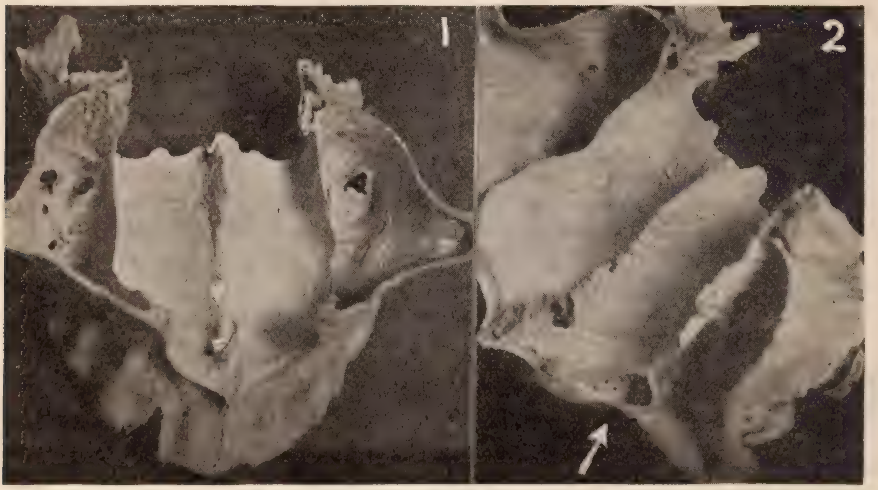


Fig. 1—The black ink locates the points at which the apices of the roots are visible.
Fig. 2—The arrow points to a pocket in the anterior wall of the antrum produced by a septum.

The extraction of devital molars is one of the most perplexing operations. The tooth structure becomes brittle and the peridental membrane seems to become calcified. When the roots are small and sinuous it is impossible to complete the extraction with them intact. Due to the anatomical structure the buccal roots are most frequently fractured in the extraction of the upper molars. Their removal without forcing them into the antrum or entering the antrum with the instruments used in extracting is exceedingly difficult and requires a very careful technic. By observing the bone structure around the apical third of the upper molars it is very evident that the instrument indicated in the extraction of these fragments is neither forcep nor elevator. The operation indicated is the formation of a flap made in such a manner that the dental ligament around the approximating teeth is not involved. The flap is retracted and the capillary oozing of the blood is controlled by the use of adrenalin and sponges. The thin buccal plate of the superior maxillary in the region of the alveolus is then removed with burs and chisels and the roots removed buccally by the use of small chisels. After thorough curettement and cutting back sharp edges of the alveolar process the flap is brought back in place and usually retained by a single stitch across the alveolus.

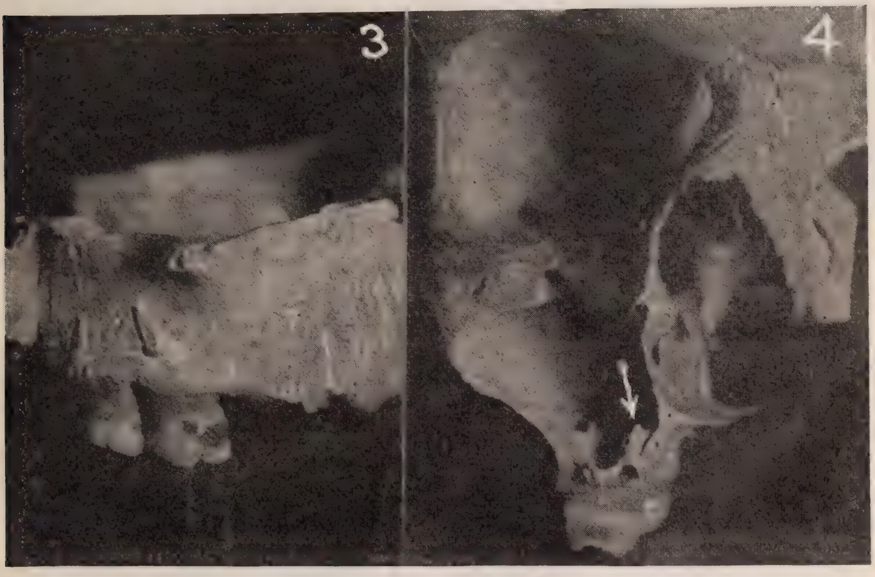
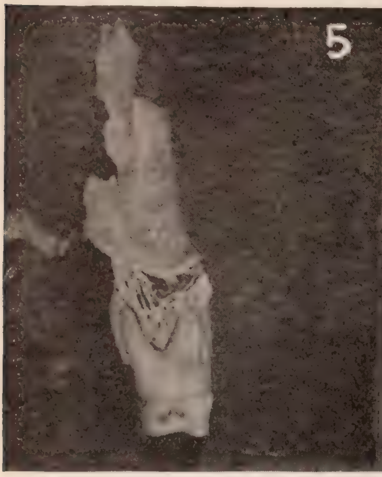


Fig. 3—The outer plate of the alveolar process is very thin and sometimes absent over the buccal roots of the superior molars.

Fig. 4—The arrow indicates a ridge of bone enclosing the lingual root of the first molar which extends directly into the cavity of the antrum. The extraction of the fractured apical third of this root could hardly be accomplished without entering the antrum.

It is not an uncommon complication in attempting the removal of these fragments to have them forced into the cavity of the antrum. In several cases this has proven to be a fortunate occurrence for the patient, as it has revealed the presence of polypi and pus. In the recovery of these lost roots it seems much more practical to make a flap and open into the antrum from the buccal side through the buccal alveoli instead of enlarging the socket by removing the section of bone



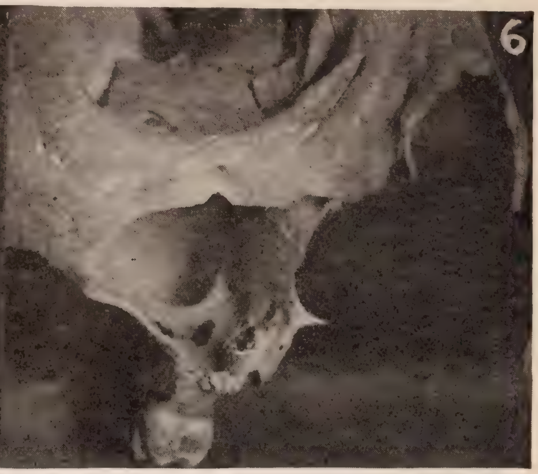


Fig. 5—In some specimens the roots of the upper molars are at a considerable distance from the floor of the antrum.

Fig. 6—The black dots indicate the points at which the roots were visible. Also note the pocket formed by the septum of bone.

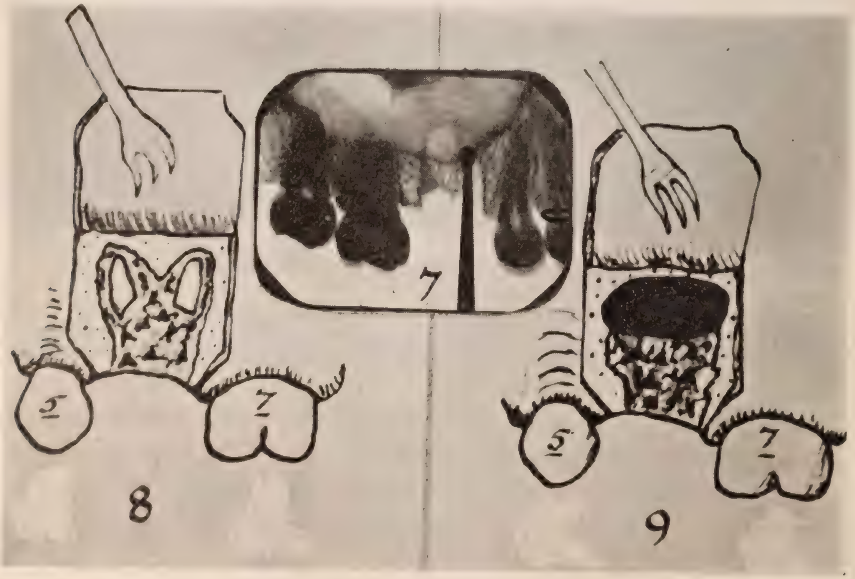


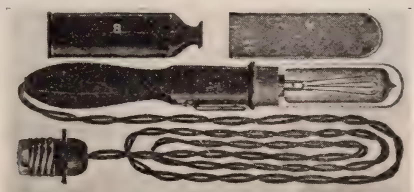
Fig. 7—A surgical bur mounted on a hand bur holder makes an ideal curette for small infected areas around the buccal roots of the upper molars as it effectively removes the diseased area without unnecessarily destroying normal bone.

Fig. 8—After making a flap and removing the thin buccal plate, the fractured apices may be easily dislodged by small chisel.

Fig. 9—If the root enters the antrum, it may be easily removed by opening through the buccal wall. This opening affords better access, better drainage and easier closure.

between the buccal and lingual roots. An opening from the buccal gives better access and allows freer use of the curette or wire loop used in recovering the root. Another advantage is the presence of the flap which can be stitched down in place providing the antrum has been found to be free from pus. This keeps out food and cuts down the number of treatments which would be necessary if the opening were made in the floor directly through the socket.

The post-operative treatment of simple cases consists merely in the irrigation of the antrum three or four times with normal saline until the flap has healed sufficiently to stop the passage of the syringe. In badly-affected antra where more thorough curettement is advisable, an opening should be made through the canine fossa and drainage be maintained through an opening into the inferior meatus. However the surgery of the antrum is not within the scope of this paper.



W. E. 5079. Freer-Jackson illuminator, for frontal sinus or antrum

10

Fig. 10—This sinus lamp affords much better illumination than the usual switchboard type.

In conclusion may it again be emphasized that it is of paramount importance for the dental oral surgeon to remove completely the root fragments in the region of the antrum, to curette and properly drain infected alveoli, and to carry out the necessary operative procedures for maxillary empyema when it is of dental origin.

AN INTERESTING AND UNUSUAL CASE

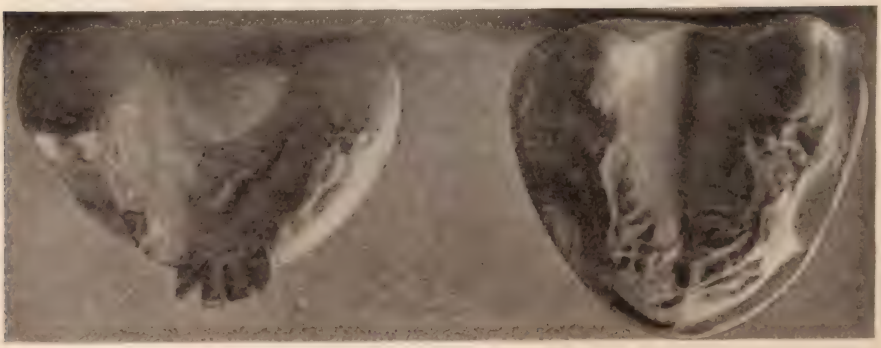
BY FREDERICK B. KREMER, D. D. S., MINNEAPOLIS, MINN.

(Written for THE DENTAL SUMMARY)

Mr. B., aged 31, height 5 ft. 3 in., weight 110 lbs.; highly nervous, and somewhat under the influence of drugs, presented for consultation. He asserted positively that he had had two complete sets of teeth removed from his mouth at previous times; that he was now in a situation of much discomfort, and was experiencing a marked degree of pain and depression. He requested an examination, which was made. The condition of the man precluded the possibility of making suitable radiographs and models, and in view of the fact that he has never returned,

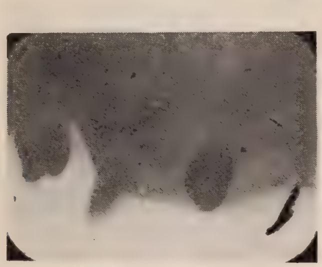
Upper Right	Upper Left
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
Lower Right	Lower Left

Upper Right	Upper Left
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1	1 2 3 4 5 6 7 8
Lower Right	Lower Left



I am compelled to present such evidence as I have, regardless of its insufficiency from a technical standpoint.

An examination of the models will show the presence in the lower jaw of seven teeth, the left lateral incisor being a dummy tooth attached to a bridge carried by the central incisors. The model of the upper jaw shows the broken-down crown and roots of the upper right numbers 6 and 7, and the incisal tips of four teeth in the anterior part of the jaw.



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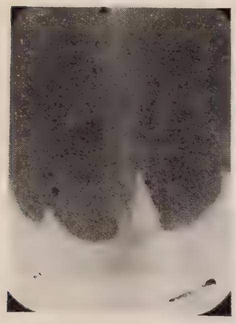

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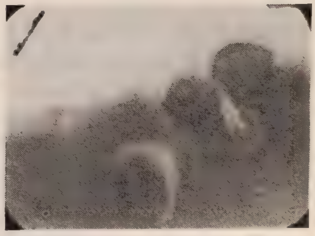

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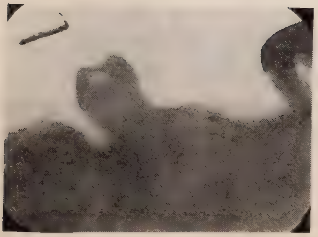

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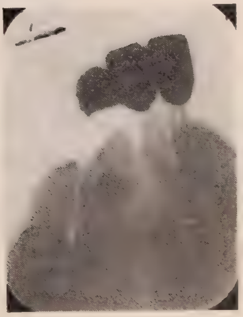
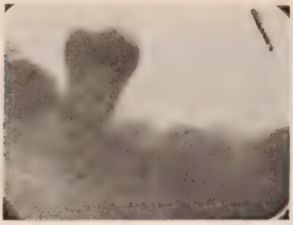


3-2-1 | | 1-2

Counting the teeth visible in the radiographs, we find thirty-one all told, subtracting from this total, eleven teeth erupted in part or in whole, we find twenty teeth remaining unerupted in the two jaws.



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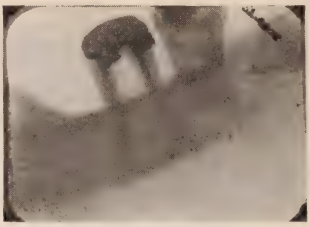
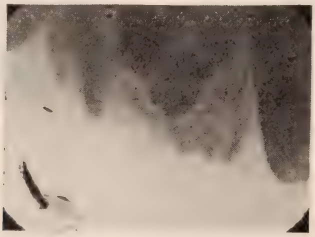


$\overline{7\text{–}8\text{–}9|}$

I regret the failure on the part of this patient to return, but I am under the impression that he values these teeth very highly as a means of securing drugs and would not readily consent to their loss for this reason.

The individual presents a very active mental state, and appears to be fully capable of transacting business sharply and shrewdly. His general appearance suggests a marked lack of physical development.



$\underline{|4\text{–}5\text{–}6}$

His statements with reference to previous extractions are merely quotations, and are not to be taken as endorsed by myself.

This case is so extreme as relates to the number of unerupted teeth, it is presented more as a matter of curiosity than with reference to the influence upon the patient.

La Salle Bldg.

A SIMPLE AND ACCURATE TECHNIC FOR CROWNING THIRD MOLARS*

BY L. E. CUSTER, A.M., D.D.S., DAYTON, OHIO

THE FUTURE HOPE of a third molar will rest almost entirely upon a more perfect adaptation at the cervical margin. There are occasions where the third molar should be saved. The subject I am trying to present to you I bring to you with some diffidence, almost entirely because of the simplicity of the process, and I don't want anyone when I have finished, to tell me he did this twenty years ago. Some of my friends say it is new.

Let us have in mind a badly broken-down, left upper third molar. The first step is to take a modeling compound impression. Fill the tray with modeling compound and warm it fairly well in front, but not so soft at the back but that it will take considerable pressure to force it into place and force it up, gently withdraw it, and give your patient something to read. Take this to the laboratory, pour it, and then form roughly upon the plaster stump the band portion of your crown. For the benefit of the younger members who do not have immediate access to the dental depot, to get the best gold to be used for crown work, make an alloy of equal parts of pure gold and the recent gold coin the government has been coining. Those in the neighborhood of 1870 seem to have been alloyed with something like cadmium and are unfit for dental work, but those recently coined are fine.

Before you melt the two parts together cut off a piece for future use in the soldering-up of your crown. Bend the band around roughly and fit it as nearly as you can. Then we come to the soldering. In Dayton, until a few years ago, we used artificial gas for the blow pipe, which was good, and then we used natural gas. I left a standing order with a dental dealer to send every gasoline blow pipe that he could get, and also for natural gas, to me, but nothing came that served as well as the dental torch made by the Prest-o-Lite people, of Indianapolis. While the solder on our crown is of coined gold, the margin is sufficiently wide that you can melt the gold without fear of melting the band. The gold coin is of high melting point. With the twenty-two carat gold solder there is quite a margin between their melting points.

I now come to the oldest thing in human existence; put a handle on the band. The first things you ever used, knife, fork and spoon had handles on them. As you begin to practice dentistry your cabinet is filled with instruments that have handles on them, even the corkscrew. So we solder a handle on this band. Place it in position, and I use a German silver wire because the melting point is high and it has stiffness. This wire should be about sixteen-gauge.

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*Stenographic report of a talk before the Ohio State Dental Society, Dec., 1919.

This German silver wire then is soldered on the buccal surface of the crown half way between the masticating surface and the gingival border, and then is given such a curve as it comes forward that it will bear on the cuspid when it is in the proper position on the third molar, and that would be the only place where it would bear. When placing it in the mouth, draw it forward so that it will contact on the second molar and also bear midway on the cuspid tooth. Always get it on the molar in the same position; it is difficult to do this, but it should be done. Take soft, black wax on which teeth are carded as they come from the dealer and fill up the band a little more than full. You can heat it a little if you wish. With my left hand I place it back in the mouth and draw it forward until it contacts with the molar in front of it, watching the handle, and then with the first finger reach back and with hard pressure press that up. Remove it from the mouth and you will have a print of the tooth. You have a fairly good fit according to the model but in several places you will see the wax has oozed out. Then with the fine blade of a lancet trim it off from within outward, cutting towards the gold. Then with a small pair of round-nosed pliers, never a large pair—that is a mistake often made in crown work—crimp it in and try it on two or three times, each time adding a little wax to it, and then you should occasionally anneal it.

Now that has been an easy method. Being satisfied as to the fit, the end is now clipped off for articulation. When you are satisfied as to that, with the standard form of stamp, you stamp the masticating end for your crown; then turn it upside down and fill the cusps full of your coin gold, the little piece you cut off first. This is trimmed and then put in the band, not on the end but on the inside. If you have cut it a little too small so that it does not impinge, then a little pinch of asbestos wool placed in the band will serve to hold it up; put the cap on, and on inspection you will see some place where it is exactly flush. On this melt the tiniest bit of your coin gold solder; that will tack the two together. Return it to the mouth using the handle, have the patient close on it and that will bring your articulation just about right. Then when you are satisfied begin the final soldering, commencing at a point diametrically opposite to where it was first tacked. Do not attempt to solder the cap end of a crown on with a big brush flame, but with a sharp-pointed flame. This is dressed off, and you are ready to set in the mouth. With a carborundum disc running up and down in the mouth, almost sever the handle from the crown, dress it two-thirds through, one sixty-fourth of an inch from the crown. After you have wiggled it loose it is but a moment's work to dress the knob left flush with the surface. Then you come to the setting. Fill the crown with cement, place the crown in position and wiggle the handle off, and that is the end of the handle and also the end of my speech.

THE PROBLEM OF PREVENTION OF SALIVARY CALCULUS

BY W. H. SAVAGE, D.D.S., CLIFTON FORGE, VA.

(Written for THE DENTAL SUMMARY)

After you have removed salivary calculus from the teeth of a given patient, have you any further interest in that mouth? If so, how do you instruct said patient whose efforts are expected to prevent further accumulations?

It is the writer's practice to pass on to the patient some of the information and knowledge given to the dental world by that genius, Dr. G. V. Black. Many are familiar with the methods he employed in his own mouth, his experiments and conclusions.

The writer's observations of his patients and their experience, together with Dr. Black's findings, prompt the assertions in this article. About two hours after a meal, in a mouth subject to this accumulation, there is an out-pouring of an agent known as "agglutinin," which serves to glue or attach the calculus to the tooth surface. Tartar, then, is present in solution in all mouths, but is not actually deposited independent of this gluing-on medium.

Where do we find the first and most abundant evidence of presence of tartar? Two conditions modify its location, nearness to openings of salivary glands and also the freedom from friction of a given surface. These, of course, are the buccal surfaces of superior molars and the lingual surfaces of the inferior incisors. However, the deposits may be sufficiently profuse as to cover the occlusal surfaces of the bicuspids and molars. The theory still holds good that the unused surfaces are the most affected; hence, in dealing with the patient, the homely expression, "The used key keeps the brightest," is employed.

This out-pouring of agglutinin seems to be a protest or revulsion of nature. Any condition which prevents the complete digestion of food favors tartar formation. You have the overfed furnace with the resulting lack of complete combustion. If more food be taken than the system can use, burn up, oxidize, such a condition makes for tartar development. Over-eating and under-exercising favor tartar. Hard water, soft water, too much, too little, have no direct influence. Dr. Black found that a cleaning out of the intestinal tract would, for as long as two weeks, keep off the deposits.

The writer is a seeker after truth and wishes to know what clinical evidence shows to others. Do you find much tartar in a so-called acid mouth? Does your patient, any patient, suffer much from the simultaneous effects of tartar and erosion?

Enough physical exercise must be taken to use up the food. The food must be well chewed to facilitate its digestion by stimulating the salivary glands and hard food should be eaten each day for its frictional influence. Certainly twice within each twenty-four hours the surfaces of the teeth must be well scrubbed, for if this be deferred as long as fifteen hours, the tartar will have become so hard that the brush will have no appreciable affect on it. Select any patient whose mouth is singularly free of this deposit, despite the fact that no personal attention is given it, and you will find teeth well arranged, saliva abundant, the patient fond of chewing hard food, and if a big eater, one who takes a great deal of muscular exercise. Hence, the diet should be governed by one's work.

Observe some patient who comes to you at frequent intervals and with your assistance is keeping these deposits under subjection. Examine this patient when back from a vacation of indolence, injudicious overeating, and you will truly find a collection.

So when we give the patient the once over, a lick and a promise, a one dollar cleaning, or mayhap an oral prophylactic seance with a disclosing solution at a decent fee, are we honest in conserving that patient's welfare unless we make some effort to instruct?

The profiteer was once asked by the overcharged victim, "Have you a horse?" To which he replied, "No, Why?" "Well, Jessie James had a horse," said the victim. If the patient's interest are to be disregarded, it would seem that the *modus operandi* of Capt. Kidd and Jessie James is by no means obsolete.

CONSERVATION OF TOOTH STRUCTURE IN TREATMENT OF ROOT CANALS*

BY EDWARD C. MILLS, D.D.S., COLUMBUS, OHIO

SUCCESSIVE CYCLES in the development of dentistry are characterized by two features: The introduction of new processes and technic, and the improvement older methods require for a proper correlation with the new. The backward swing of the pendulum from the dental aspect would indicate inefficiency in some branch of our practice, and until this is remedied our further advance in many respects is more or less handicapped.

There is probably no subject more widely discussed in the profession and out of it, than the subject of root canals and their relation to systemic conditions; this seems a time of adjustment between the best of yesterday and the prospective good of tomorrow; this has been the history of development of all science.

Previous to the advent of the X-ray, the subject had few perplexities; no hesitancy was felt in treating and filling canals and few doubted their ability to dispose of them properly, and extraction was almost considered malpractice. An occasional soreness generally was relieved by counterirritants; the operator's mind was at ease, and it was with a mistaken feeling of satisfaction that his technical skill had enabled him to render necrotic tissue compatible with the living, so far as local external appearances were concerned. I say "local external appearances" advisedly, because while there may have been other manifestations from the tooth, they were not attributable to it until the X-ray divulged the insidious foci of infection. In the flood of light thrown on the subject and the general alarm sounded against the retention of pulpless teeth, many operators resort to the forceps rather than attempt the retention of any tooth where the pulp is involved. This, to my mind is somewhat radical, as clinical evidence demonstrates the possibility of retaining them by efficient methods, and we owe it to the laity to develop our efficiency to the end that we may increase the per cent. of possibilities.

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*Read before the Ohio State Dental Society, Dec., 1919.

Pathological conditions are a sequence to faulty root fillings, except perhaps in some putrescent pulps of long standing, and the gist of the matter now seems to depend on a suitable filling material as largely as on proper technic; essentially on both.

In regard to technic, and with no desire to jar your optimism, I desire to refer to a report of the mechanical operation of preparing and filling root canals published in the *Dental Review*, (September, 1910). This report was the second after an interval of ten years, for the purpose of noting any improvement in results during that time. Extracted teeth with their roots imbedded in plaster of Paris were sent to a large number of dentists, with the request that they prepare and fill the root canals by their usual methods and return them. They were filed down to expose the fillings, photographed and slides made. The second series comprised fifty-two fillings, and examinations with some degree of leniency, failed to show an even dozen that could be called good. Many fillings failed to reach the upper third of the canal; fewer still to the apex; and many that did reach this point were porous. The fillings of ten years previous averaged better than the later series. If we can do better work in the mouth when handicapped by poorer access, light, saliva and a nervous patient, we may have a higher per cent. of good root-canal fillings; but a lingering doubt as to this point remains with me.

From the foregoing report we must conclude that success in root-canal work is as dependable on a suitable filling material as on technic, and the comparatively recent contributions of Callahan and Howe point to a solution of the difficulties in this line of practice.

In review of the great mass of literature that has been contributed on the subject, we find that all writers agree on one point, viz., the importance of obtaining the best possible access to the root canals; being careful not to mar the floor of the pulp chamber on account of the grooves in which usually are found the funnel-shaped opening of the root canals, and therefore valuable guides in root-canal technic.

The latest and most authoritative works on this subject advocate the removal of the entire roof or dentinal covering of the pulp chamber in molars and bicuspids. This procedure would have unanimous approval were all devitalized teeth to be used as abutments for bridges, or reception of crowns; but if we desire an inlay or filling restoration, we must be more conservative of tooth structure, and decrease the large percentage of fractures due to large mesio-disto-occlusal, distal and mesial cavities. The buccal and lingual portions are frail from loss of dentin and the danger is the breakage of either lingual or buccal wall and cusp due to wedging of food between their central inclines in mastication; true, modern cavity preparation correctly advocates the sloping or partial removing of these cusps, for sufficient filling material to be built over them for protection against the splitting stress, but in event of subsequent caries appearing buccally or lingually, their preservation would be almost hopeless. The force of mastication is great, and a factor too seldom considered. Dr. Black's experiments showed this force to vary from twenty-five to two hundred and seventy-five pounds, the average force exerted being one hundred and seventy-five pounds on the molars and considerable less on the bicuspids and incisors. In these tests, those making the trial of bite stopped because of pain in the peridental membrane, rather than from having reached the maximum of muscular power. Test of crowns of freshly-extracted teeth also showed that they had strength to resist greater pressure than could possibly be brought on them when in their position in the mouth—a striking evidence of Nature's bounty in our physical economy.

In study of the anatomy of the occlusal surfaces of bicuspids and molars we find an arrangement of cusps, oblique and triangular ridges, grooves and fossæ so arranged that we have a perfect system of occluding surfaces for comminution of food particles. In the lateral motion of the mandible, the greatest stress is against the buccal and lingual cusps; to fortify these vulnerable points, Nature has been bountiful in her supply of tooth structure in the oblique and triangular ridges of the upper first and second molars, the dense structure mesial and distal of the central fossæ in the lower molars and the heavy triangular ridges of the bicuspids. These tissues are the brawn and fiber of the tooth against cleavage, and the large mass of these structures excepting in the lower molars, overlie the pulp chamber. The importance of conserving this portion of the tooth is outweighed only by our inability to get access to the root canals; in this event the mutilation is so great that often the only alternative is to crown the tooth or fill with a view of crowning or extracting later, as fractures, especially with the molars and upper bicuspids are in most instances inevitable.

Mesially and distal to these ridges we have pits or grooves in the bicuspids and grooves in the molars, portions of the tooth most susceptible to caries.

Almost one hundred years ago LaFoulon, a French writer, stated that Nature formed the root canals to guide the dentist in inserting a dowel! he could as truthfully have added that she formed these pits and grooves, (vulnerable points that they are), to guide us in reaching the root canals in a manner conservative to the strength of the tooth.

In mesial cavities of the molars and bicuspids the matter of access to root canals does not necessitate such extensive removal of structure, but in the distal cavities of the molars and bicuspids, especially the former, to obtain proper access and treat and fill through the cavity, it is almost imperative that we remove the entire roof or dental covering of the pulp chamber, especially to reach the mesial lower, or meiso-buccal upper roots; and even when this method is resorted to, the skiagraph usually indicates our failures are at the apices of these roots.

As a conservative measure regarding tooth structure, in cases of distal cavities involving the pulp, my practice is to remove sufficient debris to devitalize, after which the cavity is prepared for a permanent filling; if there is a sufficient opening into the pulp chamber that a portion can be removed, this is done, a styptic applied if necessary and the chamber filled with temporary stopping to the point of original exposure to exclude filling from the same and the permanent filling inserted. At the same sitting a mesial pit or groove is opened through to the pulp chamber, which is made funnel shape, with opening or concavity directed toward the pulp chamber; the temporary filling which has been placed in the pulp chamber previously is removed, and access to the canal is readily obtained, and the important strengthening portions of the tooth remain *in situ*. In event of extensive caries involving the pulp chamber and exposing the openings of distal root or lingual root canals, their contents are removed and as a matter of precaution, the access to them is maintained by a barbed broach wrapped in bibulous paper inserted in the canals, which is withdrawn immediately after the filling is inserted, preserving access to the canals. An additional advantage in this method is the control of medicaments and increased comfort to the patient.

It is not within the compass of this paper to discuss the preparatory treatment of root canals, but from experience and observation it is my firm belief that the sooner we eliminate all irritating antiseptics and cauterizing agents, such as the formalin preparations, etc., from our root-canal work, the sooner we will have healthier pericemental tissues and less denuded, eroded and necrotic tissue at the apices and sockets. No drug should be sealed in a root canal which would cause injury to soft tissues elsewhere; this practice has resulted in a large percentage of incurable chronic alveolar abscesses. And relative to this subject, we would refer to an article by Dr. A. H. Peck, *Dental Review*, Vol. XII, page 593. Where an antiseptic is indicated, it should be mild and non-irritating.

A study of the structure of the teeth and experiments in regard to their crushing power, show that Nature has endowed them with strength more than sufficient to perform their natural and intended functions, and the conservation of this bounty should be one of the outstanding features of efficient dentistry.

For the use of the slides used to illustrate this paper, I am indebted to Dr. Arthur D. Black, of Chicago, all of them appearing as illustrations in his father's works; *Operative Dentistry*, 1908, and *Special Dental Pathology*, 1915. *Fig. 1* shows the fossæ pits, fissures and triangular ridges of the bicuspids and molars; these points are the most liable and usually the first points of decay, and with a mesial or distal cavity involving the pulp these points usually indicate the most direct access to the pulp chamber and canals; the triangular ridges fortify the tooth against the great lateral stress, and access mesially or distally to them will conserve the usefulness of these valuable organs.

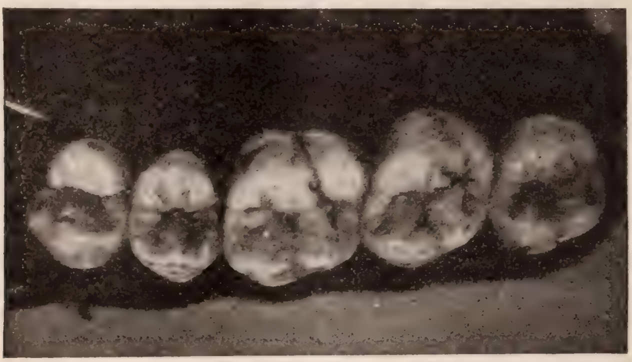

Fig. 1

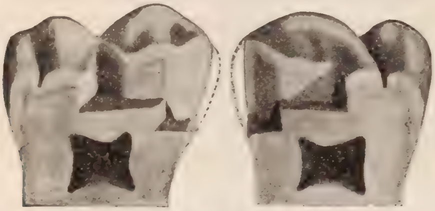

Fig. 2

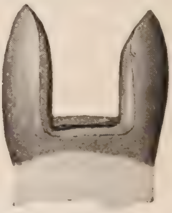

Fig. 3

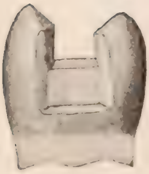

Fig. 4

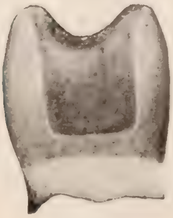

Fig. 5

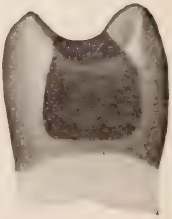

Fig. 6

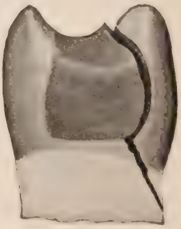

Fig. 7

Fig. 2 shows a mesiodistal longitudinal section of lower molar; in case of exposure of pulp from distal surface it would be practically impossible to get proper access to the canals in the mesial roots without entire removal of the dense and heavy structures overlying the pulp chamber. Observe the direct access to either distal or mesial root from a mesial groove which usually appears at a point approximately over the occluso-mesial angle of the pulp chamber.

Fig. 3 illustrates a bicuspid where these heavy tissues resistant to lateral stress have been removed.

Fig. 4, the proper preparation of the lateral walls, and *Fig. 5*, a filling which protects these lateral walls by extending over the cusps, and barring gingival or lingual decay, will in most cases prolong the usefulness of the tooth. Unfortunately however, the usual formation of the cavity with filling inserted is indicated in *Fig. 6*, and the consequent results with which we are all familiar shown in *Fig. 7*.

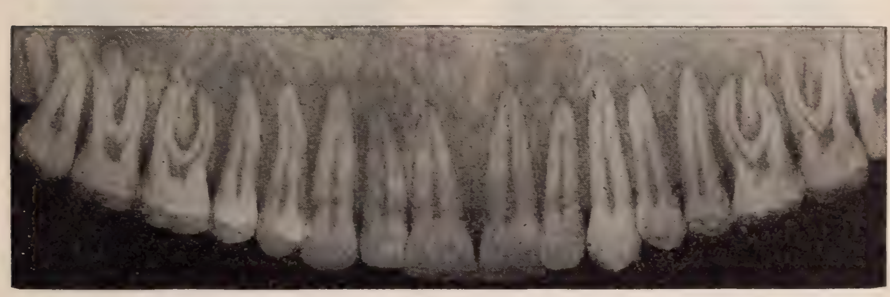

Fig. 8

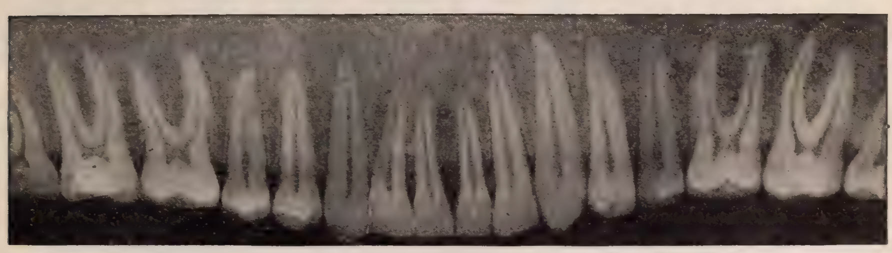

Fig. 9

When we are obliged to take care of these lateral walls, remember that a little more time and a little more tooth structure removed will more than compensate for the condition shown in the last figure.

Figs. 8 and 9 are panoramic radiographic views of normal upper and lower dentures showing pulp chambers and canals; a close study of these illustrations will suggest landmarks by which we can more readily and accurately reach the pulp chambers conservatively of tooth structure, and incidentally guides us in our operations in making bridge attachments to vital teeth.

In my paper I referred to the use of irritating drugs in the treatment of root canals and their destructive results on the periapical tissues;

Fig. 10 is a photograph of a forearm taken seven days after an application of cresol and formalin was removed; a pledget of cotton saturated with the solution was laid on the arm, a piece of rubber dam placed over it and held in position with court plaster; after twenty-four hours the dressing was removed and it showed considerable inflammation and pain. After seven days there was much more inflammation and considerable sloughing.

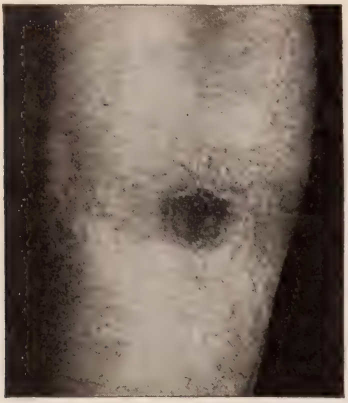
Fig. 10

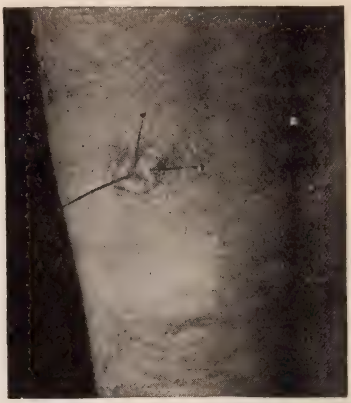
Fig. 11

Fig. 11 shows three pins which were pushed in nearly one third of an inch before any sensation was felt—this lesion looked practically the same several weeks later.

Oil of cinnamon, cloves or eucalyptus showed no inflammation of tissue. Let us be more conservative in the use of medicaments and we will increase the possibility of saving more pulpless teeth.

Susquehanna Dental Association of Pennsylvania

The Fifty-seventh annual meeting of the Susquehanna Dental Association will be held at Hotel Sterling, Wilkes-Barre, Pennsylvania, October 26-27-28, 1920.

FULLER L. DAVENPORT, *Chairman*
520 Miners Bank Bldg.

IMPORTANT PRINCIPLES OF PROPHYLAXIS AS REGARDS PYORRHEA PROCEDURE INDICATED AND HOME TREATMENT

BY J. P. CARMICHAEL, D.D.S., MILWAUKEE, WISCONSIN

(Written by request for THE DENTAL SUMMARY)

THE BUSY DENTIST does not stop to consider the reasons for the general prevalence of infected gums although he is constantly confronted with these conditions in his practice. By a moment's reflection any practitioner will see that our dentifrices in former years have been wrong, as they contained ingredients harmful to both tooth texture and gum tissue.

I am disposed to believe that pyorrhea with all its ills, is preventable. This finds conviction in the fact now definitely proven that pyorrhea is primarily of an infectious nature. Present knowledge of the causes that produce infection makes it possible to prevent attacks of pyorrhea as well as prevent its recurrence and at all times maintain a healthy mouth. When this state of perfection has been reached, scientific knowledge will have added at least ten years to the span of human life, as well as providing old age with the joy of living.

If we take into account our artificial modes of living, the misconception of the public, and the disregard as well as the inability of many dentist to recognize the real conditions that exist in the mouth, we are forced to the conclusion that it will require the weight and influence of the profession for years to establish proper prophylactic measures.

An important factor is to recognize pyorrhea in all its varying types and different stages of development; therefore we should have a clear understanding of the causes that are operative in producing this particular diseased condition.

Not until pyorrhea has attained a chronic condition are some dentists willing to admit its existence, and it is just those very dentists who enter most numerous complaints concerning the difficulties of its treatment. *Obviously a disease that manifests in its chronic form, loose teeth and a flow of pus, certainly has a more innocent antecedent condition, constituting an earlier stage of the disease.*

Those who have followed Dr. W. F. Dunlop, of New York, closely, in studying the effects of bacterial invasion of the gums are able to see conditions that occur in the early stages of dental pyorrhea that heretofore have passed unnoticed; hence they never were recognized as a condition of pyorrhea.

Unfortunately, those earlier stages were regarded as innocent affairs and totally disregarded or palliatively treated at the most; hence the primal infection steadily advances to the chronic stage. The recognition of pyorrhea in its incipient stage waits upon an accurate observation of its existence and progress, and this development is in most instances practically uniform, the various structures being involved in orderly succession, beginning in the soft tissues.

If we are willing to acknowledge that pyorrhea has its origin from an infective process resulting in an inflammation of the soft tissue enveloping the teeth, then the important consideration is how best to eliminate those conditions that have a tendency to encourage bacterial activity.

From clinical observation I have noted without variance that all pyorrheal processes are preceded in the early stage by gum infection. This infection at first manifests itself in a localized area of inflammation, which, we know, is accompanied by œdema and œdema makes for a lessened resistance. The swollen tissue opens the way for further infection which travels along the line of least resistance to parts of lessened vitality, namely, the alveolar bone and peridental membrane.

Many of those serious systemic conditions caused by pyorrhea may readily be obviated if we but learn promptly to recognize the local condition in its earlier stages, when remediable measures are of most avail.

Bearing in mind that the gums in every instance are the seat of primary invasion through which the inroads of pyorrheal infections are made, we should strenuously guard the health of this vitally important tissue. A *healthy gum safeguards against a pyorrheal condition.*

All inflammation is due to bacterial activity (except it be contusion), and all germs propagate in a suitable culture medium, in which they become active and secrete toxins. Here we have the beginning of our destructive process.

Let us consider a diseased tooth which we are about to disturb in the gum tissue. Here we have a deep-seated infection that has been progressing for years. A good surgeon would clean up the field of operation, and after the operation would use a surgical dressing to protect the wound from re-infection. It is the general practice for dentists to extract teeth, remove calcareous deposits, and otherwise injure the inflamed gum, and provide no special treatment, except occasionally using some simple mouth wash. While the abundant blood supply in the gum tissue wonderfully aids the healing process, dentists are not justified in curetting teeth and leaving an exposed root surface, and a wounded, sore gum without protection.

Personally, I would prefer to leave a coating of lime deposit over the exposed root surface when present, than to scrape the root bare and leave it without suitable protection. There is no harm in this deposit above the gum line if it could be kept clean, but, of course, it is apt to harbor bacteria. If, after the virulent inflammatory conditions subside, the root is then curetted, the area involved covered with a healing surgical dressing that will as well protect the exposed root from thermal shock and the gum from reinfection, the sensitive conditions that usually follow these operations can be avoided.

There are several important features to be considered in the development of proper surgical dressing to be used in the mouth. A preparation for this purpose must have a body consistency that will afford a covering for the teeth and gums, and at the same time will not be dissolved away by the fluids of the mouth or be disagreeable to the taste; it must also possess healing properties and be harmless in the event of its being swallowed; it must be soft and pliable, so that it can be forced between the teeth; and, when necessary, removed and replaced by the patient.

The Carmi Surgical Dressing meets all these requirements; it comprises a boric acid paste with a petroleum base made suitably plastic so that it can be spread over the teeth and gums; it provides a dressing of the greatest value in pyorrhea treatment and after extraction, and is indispensable in all operations involving the gum tissue.

The most valuable antiseptic known is boracic acid, for the reason that it inhibits bacterial activity without injury to the living tissue; therefore, in combination with a petroleum base, it provides a dressing that will guard against re-infection after the removal of necrotic tissue. The gums need this protection for at least twenty-four hours; its application for even a few hours results in great benefit. There are many patients who gladly continue its use for a week or ten days for the protection and comfort it affords to the sensitive roots after the removal of tartar.

We know that bacteria must have a culture media to cause infection and that infection causes inflammation, and that inflammation is a forerunner of pyorrhea. The logical principles that would constitute the correct treatment would be to remove the physical disturbance without injury to the living tissue.

Bearing in mind those observations regarding the importance, the origin, and nature of the beginning of infections in the oral cavity, and more specifically in the gum tissue, we will lend our interest to the ways and means by which those infections can best be prevented.

Many are the ways that have been devised to accomplish this end, but not all have met with success. Either the methods in themselves were wrong or the materials used were harmful and defeated the very end for which they were employed. This state of affairs strikingly suggests the great need of more uniformity in following a course of prophylactic measures.

We cannot think of removing the infectious matter that keeps on accumulating beneath the loose, inflamed gum margin and between the teeth by the ordinary means of a tooth brush; and it does not help to apply the ordinary tooth powders and pastes which in themselves actually add a culture medium to the already infected area. Any sugar, soap or gelatinous material in tooth pastes, when once dissipated of their antiseptic properties by the fluids of the mouth, help do the very thing we are seeking to eliminate. By using them we lend aid to the infectious process we are trying to prevent, for these same substances left behind, after the use of a gelatinous paste, may for all practical purposes be considered as culture medium. Under these conditions the inflammation is aggravated, and no mouth wash here applied is sufficiently penetrating to destroy any except the most superficial organisms, and much less capable are they of washing away sticky deposits.

So inadequate has been the result obtained in former years in prophylactic treatment for the prevention of diseases of the oral cavity, that it became quite evident that the need of radical changes was imperative.

Preliminary to instrumentation or the removal of sticky deposits, the first step is to provide for the patient's home use a dentifrice that will, by mechanical means, free the teeth and gums from the clinging infectious matter. Carmi Cleaner Powder makes an excellent preparation to be used with the tooth brush prior to instrumentation in advanced cases of pyorrhea. The next few days will show a marked improvement in the inflamed gums and instrumentation may then be conducted with a fair degree of impunity.

To accomplish these most important prophylactic measures requires an entirely new departure in materials used as a base, as well as other ingredients entering into the composition of the preparations that make up the proper home treatment for the teeth.

The greatest number of important physical measures obtainable in any one preparation is made possible through the compounding of a tooth powder from which all gritty as well as sticky substances can be eliminated, and at the same time maintain enough resistance to keep the teeth clean and polished.

The Carmi Lustro Tooth Powder is compounded upon these principles and contains the following enumerated fundamentals:

A preparation containing soluble organic substances that will free the teeth and gums from the deposits that harbor bacteria.

A preparation that will mechanically remove the infectious matter without injury to the natural enamel luster. Polished enamel will ward off microbic plaques.

A preparation containing ingredients that will stimulate the natural flow of secretions and guard against re-infection, at the same time stimulate and aid the healing process.

A preparation that can be rubbed beneath the loose gums and between the teeth, that will readily be washed and dissolved away in rinsing the mouth.

A preparation that leaves the mouth with an agreeable sensation of cleanliness.

A preparation that by physical means releases infectious matter, *and can be used as often as the teeth may require brushing.*

This combination comprises a tooth powder that so readily unites with water that only a few drops of water in the brush will combine quickly with the powder forming a stiff heavy paste, enabling the user to work more of the powder in and about the teeth and gums. A large quantity should be used as it is more effective than in a soft running condition; this powder is so soluble that it will disappear in the brushing.

It is important that patients know how properly to brush the teeth. I would suggest the method so well presented by Dr. H. G. Morton, of Milwaukee; demonstrate to each patient the manner of rotary brushing; by this method the bristles of the brush are forced between the teeth and the preparation used will be carried under the loose gum and between the teeth. Only such powders or pastes that are absolutely soluble or are carried away by rinsing are permissible.

The Carmi Lustro preparations are harmonious and are prepared with the idea of the different preparations being used either separately or in combination; and will be found ideal when used together. It is well to instruct the patient to follow the use of the *Tooth Powder* with the *Tooth Paste.*

Lustro Tooth Paste has as a base borated glycerin in combination with natural silicon oxid, the composition of which is so soluble that it will entirely disappear in the brushing of the teeth, and its dehydrating properties will draw off the toxins from the inflamed gum tissue. Natural silicon dioxid unites with and carries away bacterial matter that has found lodgment beneath the loose gum.

For the treatment of inflamed gum margins it would be found important that the patient be instructed in the value of using Carmi Lustro tape charged with a friction powder. The flat tape can be carried entirely around the tooth, drawing it beneath the loose gum tissue. This provides a means of removing infectious matter that cannot be reached otherwise and will burnish rather than wear away tooth texture. Taping is an important daily operation.

To enhance the brilliancy of the teeth and to massage the gums, as well as to reach those surfaces of the teeth that are out of range for the tooth brush, the Carmi Lustro tooth napkin occupies a place in dental prophylaxis that is of untold value. We seldom examine a mouth that we do not find the gum margin of the lingual surfaces of the molars decidedly neglected owing to the fact that very few people are able to force a brush to the gum margin between the tongue and the teeth; here the finger sensation directs the proper application of the tooth napkin and the pressure removes the infectious matter from beneath the gum, resulting in a service that will prove its value in maintaining a healthy gum where the brush has failed.

The use of a thin orange-wood tooth pick always should be encouraged.

The dentist must insist upon the patient following the requirements that are indicated which may necessitate all of these and other prophylactic measures, *for after a cure has been accomplished the big problem is to prevent recurrence.* The natural tendency of the patient is to continue his old, established habits in the care of his teeth, and in a short time the former conditions that caused the disease in the first place are almost certain to return; hence in a few months the patient returns with manifestations of the disease with which he was afflicted before treatment.

There are many practitioners of note in this special field of practice, who follow the principles as here outlined; they recommend a complete prophylactic outfit, with which the dentist can keep his patient supplied at a charge that he would not feel embarrassed in making. An outfit consists of Tooth Powder, Tooth Paste, Tooth Napkin, Powdered Dental Foss Tape, and when desired, a tooth brush, making a complete home treatment.

A patient properly expects direction for special daily treatment from the dentist in whom he has placed his confidence, and looks with less regard upon the dentist who sends him to a drug store for commercial tooth paste, which the patient has seen advertised in newspapers. As for the dentist, he is never sure that the patient is using what he has prescribed, unless he supplies them with it himself. Dentists supplying their patients with the preparations they are to use commend this practice, not only from the standpoint of attaining better results in their pyorrhea treatment, but because it is a business-builder, and also helps keep practitioners in closer touch with their patients.

The adoption of those prophylactic measures would not only mean more permanency in dental operations, but makes for far better results in the prevention and cure of pyorrhea.

615 Wells Building.

OPPORTUNITY

They do me wrong who say I come no more
When once I knock and fail to find you in:
For, every day I stand outside your door
And bid you wake, and rise to fight and win.

Wail not for precious chances passed away,
Weep not for golden ages on the wane.
Each night I burn the records of the day;
At sunrise every soul is born again.

General Peyton C. March gives estimate of expenditures of United States for entire period of war at $23,363,000,000. Normal expenditures of Government is placed at $2,069,000,000, leaving $21,294,000,000 as war expenditures, of which War Department has spent roughly $14,000,000,000, about 66⅔ per cent. of entire amount

FUNDAMENTALS OF OPERATIVE DENTISTRY*

BY W. H. O. McGEHEE, M.D., D.D.S., CLEVELAND, OHIO

PROFESSOR OF OPERATIVE DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND SUPERINTENDENT OF CLINICS IN THE DENTAL SCHOOL OF WESTERN RESERVE UNIVERSITY.

EXCLUSION OF MOISTURE

EXCLUSION of the secretions of the mouth from the field of operation and the production of absolute dryness are essential to the correct performance of most dental operations. This is necessary for the following reasons:

First, to secure cohesion of gold.

Second, to perfect the view of cavities.

Third, to prevent recurrence of decay under fillings.

Fourth, to diminish pain.

Fifth, to accomplish and maintain sterilization of cavities and canals.

Sixth, to avoid discoloration during operations in canals.

Seventh, to prevent disintegration of cements and gutta percha.

Eighth, to prevent dilution and spreading of medicinal agents.

The presence of the slightest trace of moisture destroys the cohesive property of gold, thus interfering with its working properties. There are very few cavities the preparation of which should be attempted without the application of the rubber dam, since it is well nigh impossible to perform proper cavity preparation in the presence of moisture, which interferes with an adequate view and may result in the leaving of traces of carious matter, or the neglect of other important details. Saliva always contains many varieties of micro-organisms and other material of a fermentable or putrefactive nature, capable of producing caries and discoloration of tooth structure. As a result, if it be allowed access during operations on the teeth, it will, in many instances, produce discoloration under and around fillings and the undermining of these, through a recurrence of decay.

The introduction into, or imperfect removal of saliva from root canals, is likely to be productive of inflammatory disturbances and septic conditions in the apical space, as well as discoloration of tooth structure after canal operations. In cases of hypersensitive cavities, the removal of all traces of moisture will greatly diminish the pain incident to the operation, and make operative procedures less difficult. In the application of medicinal agents, the presence of moisture will greatly reduce the curative effect desired, through dilution and consequent reduction in the strength of the drugs used. Access of moisture during the introduction of cements and gutta perchas will interfere with their proper

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(*Continued from page 612, July SUMMARY).

adaptation to the walls of cavities (this is true of all filling materials), as well as produce disintegration of these substances. Dryness is essential in amalgam work, since moisture destroys or changes the characteristics imparted to this material by the manufacturer.

The introduction of the rubber dam into dentistry by Dr. Samuel C. Barnum, of New York City, in 1864, resulted in great improvement in the technic of dental operations, and the advancement of dentistry as a profession consequently received a marked impetus. Moisture may be more readily and perfectly excluded with this adjunct than through the use of absorbents. The use of the latter should, as a rule, be confined to operations on the soft tissues of the mouth and very short or simple procedures on the hard structures. The rubber dam is in reality a *time-saver*, since the slightly additional time required for its application is, in the majority of cases, overbalanced by the elimination of the troubles, inconveniences and seepages of moisture frequently arising during the use of absorbents. Many students seem to have, in the beginning, a natural timidity in regard to its application, and are prone to attempt to dispense with it on that account. Frequent practice in its use will eliminate this feeling and result in efficiency in its application.

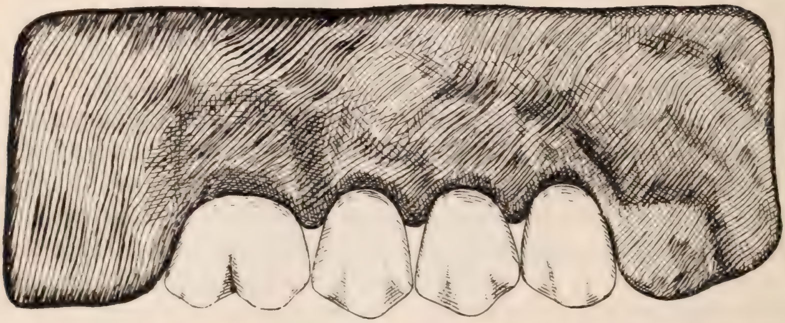


Fig. 75—Rubber cloth adjusted to upper right side of mouth. The edges of the holes encircling the necks of the teeth should point upward, under the free gingiva, thus forming a valve-like arrangement, which prevents seepage of moisture on to the crowns of the teeth included in the dam.

143. Name two *Methods* of excluding moisture.

First, by use of the rubber dam (*Fig. 75*).

Second, by use of absorbents and non-absorbents.

144. Classify *Rubber Dams*.

First, light.

Second, medium.

Third, heavy.

145. Name the *Advantages and Disadvantages* of each.

Light weight dam is easily applied, but is more readily torn; while heavy dam is more difficult to handle, but less readily injured. Medium weight usually is preferred, because it possesses the advantages of the other two varieties, with a minimum of the disadvantages mentioned.

146. What is the *Advantage of a Light Colored* dam?

It absorbs less, and reflects more light.

147. By what method may its *Purity be Tested?*

Stretch it well over the end of the thumb or finger, when, if on relief of the pressure, it returns to its original shape, without tearing or buckling, it is fit for use.

148. Into what *Sizes and Shapes* may it be cut for use?

Triangular, oblong and square. Cutting into triangular form is economical, this form being cut from pieces six to nine inches wide. If the oblong form is used for anterior teeth it should be about three and one-half to four inches in length, from its upper to its lower border. For molars the dam should be cut into square form and measure at least five inches from upper to lower border; while the size and shape for bicuspids should be intermediate between that for the anteriors and the molars. It should always be cut large enough to cover the upper lip and chin, but should not interfere with the nostrils.

149. *How Many Teeth* should be included in the dam?

For operations on the six anteriors, at least two teeth mesial and two distal to the tooth to be operated upon. For the bicuspids of either side, include one or more of the molars and as far forward as the lateral, while for molar operations, make the application to include the bicuspids and at least one, or better two teeth distal to the one operated upon. (*Figs. 76, 77, 78, and 79*).

150. What *Conditions Regulate the Space* between the holes?

First, the space between the teeth (wide interproximal spaces, wide spaces between the holes).

Second, the height of the gum festoon (large festoons or receded gums, large spaces).

Third, the weight of dam (light weight, large spaces).

Fourth, the size of the teeth (large teeth, large spaces).

151. What is the *Average Space?*

Two to four millimeters.

152. What regulates the *Size of Hole?*

The size of the tooth. The hole should not be cut too *small.* For illustrations showing preparation of the dam for use see *Figs. 76, 77, 78, 79.*

153. What *General Rules* should be observed before and after removal of dam?

First, remove calculus and glutinous deposits and douche the teeth with warm water before applying the dam.

Second, test the contacts and cleanse the interproximal spaces with floss silk before application.

Third, remove with a thin spatula or saw all jagged edges of enamel before application.

Fourth, be sure no ligatures or fragments of rubber are left in position after removal.

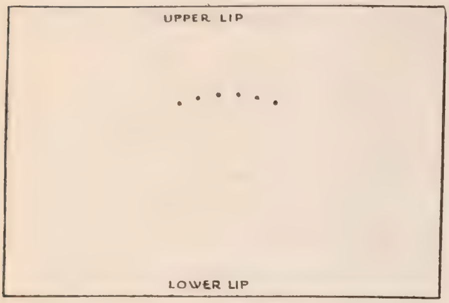


Fig. 76

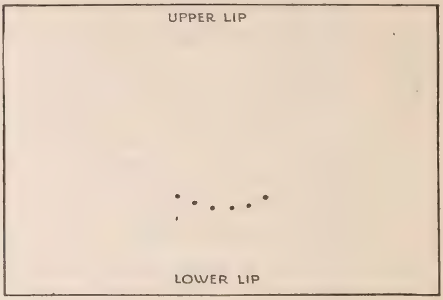
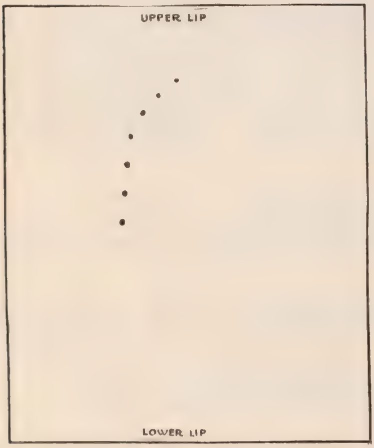


Fig. 77

Fig. 76—Rubber dam cut and holes punched for application to the upper anterior teeth.

Fig. 77—Rubber dam cut and holes punched for application to lower anterior teeth.



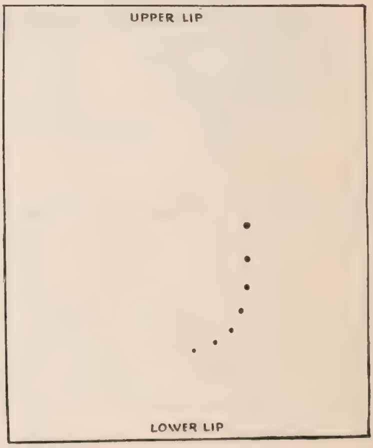


Fig. 78—Cloth cut and prepared for application to upper right central, lateral, cuspid, bicuspids and first and second molars.

Fig. 79—Cloth prepared for application to lower teeth on the left side.

Fifth, flush with warm water and massage the gums after removal of the dam, to restore the circulation.

All of these procedures are desirable to insure easy adaptation of the rubber cloth and to prevent the tendency to injury or infection of the soft tissues.

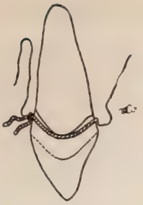


Fig. 80

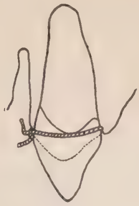


Fig. 81

Fig. 80—Ligature applied. In this illustration, it may be seen that if the ligature were pulled tighter around the neck of the tooth it would be likely to produce great injury to the pericemental fibers.

Fig. 81—Ligature applied. The pericemental fibers are protected, but the ligature probably would slip down, because it is not forced quite high enough on the labial side.

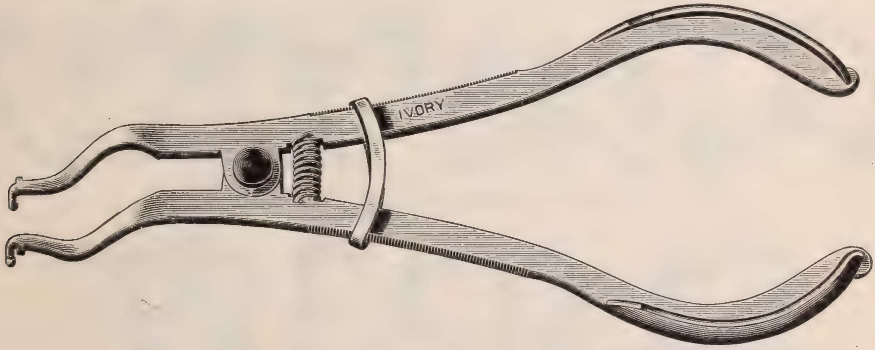
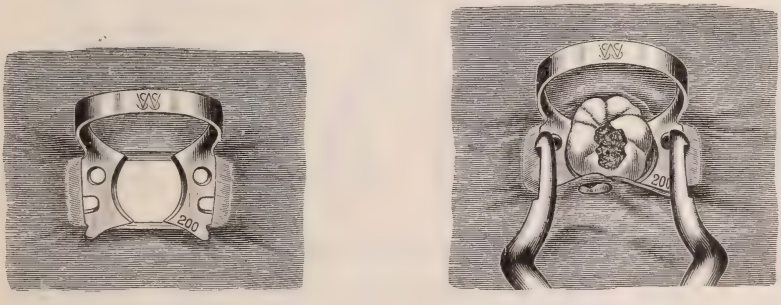
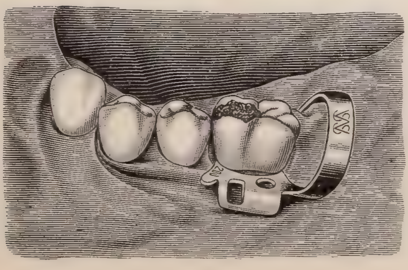


Fig. 82—Rubber dam clamp forceps.



A

B



C

Fig. 83—Steps in the application of the rubber dam clamp:

A. Inserting the clamp into the rubber.
B. Applying to a molar.
C. Dam in position.

154. What *Dangers* should be avoided in the application of clamps and ligatures?

First, wounding the gums and pericementum, with consequent tendency to the production of permanent injury. (*Figs. 80 and 81*).

Second, damage to the enamel from ill-fitting and carelessly-applied clamps. (*Figs. 82 and 83*).

Third, production of pain.

155. What methods may be resorted to in adjusting to *Close Spaces* and in *Difficult Cases?*

First, separation of the teeth by a thin spatula, or a wedge, to assist in forcing the dam or ligature to position.

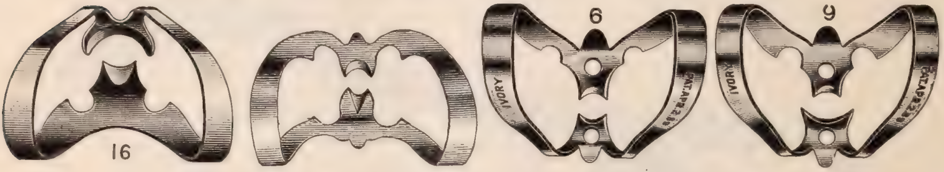


Fig. 84—Rubber dam clamps for anterior teeth and roots.

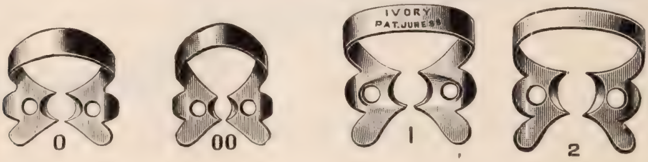


Fig. 85—Rubber dam clamps for bicuspids.

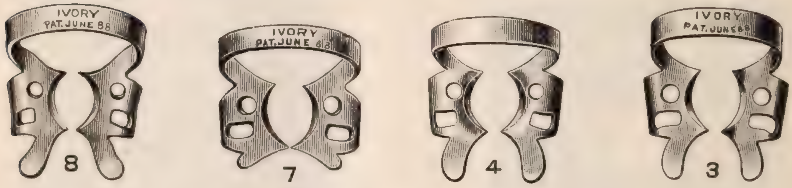


Fig. 86—Rubber dam clamps for molars.

Second, application of vaseline to the teeth included in the dam, to cause it to move into position more readily.

Third, application of clove oil, cocain or novocain to the gums for relief of pain.

Fourth, swab the teeth with alcohol to remove mucous deposits, thus avoiding slipping of the dam from position.

Fifth, use of rubber tubing, beads, cotton, or knots tied into the ligature and applied on the lingual aspect of the teeth ligated; or of sandarac varnish; or of cotton packed into the interproximal spaces, to prevent the rubber from slipping from position.

156. Name several prominent *Sets of Rubber Dam Clamps.*

Ivory, S. S. White, Palmer, Huey, Black. (*Figs. 84, 85 and 86*).

157. Name several *Cervical Clamps.*

Ivory, Keefe, Dunn, Hatch, Woodward. (*Fig. 87*).

158. What two classes of teeth are especially *Difficult to Clamp?*

First, bell-crowned teeth, on account of the tendency of the clamp to slide toward the gum.

Second, thick-neck, and peg-shaped teeth, in which the tendency is to slip off the tooth.

159. What three *General Methods* are applicable for the exclusion of saliva for *Short Operations*?

First, by means of absorbents.

Second, by application of non-absorbents.

Third, by the combined use of absorbents and non-absorbents.

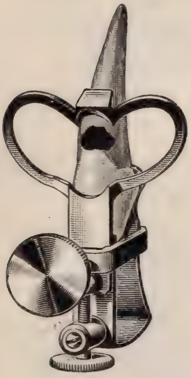


Fig. 87—Cervical clamp in position.

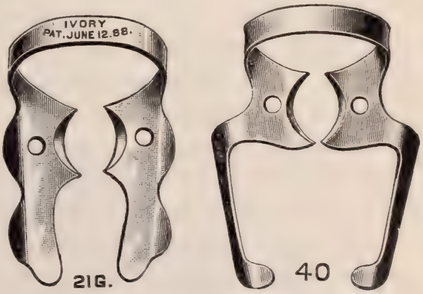


Fig. 88—Cotton roll clamps.

160. What is meant by *Absorbents,* and name the substances used as such.

Materials for absorbing moisture, such as *cotton rolls, mouth napkins,* (both cloth and paper), *cottonoid, lintine, absorbent cotton, bibulous paper, absorbent pledgets, absorbent points* (for canals).

161. What is meant by *Non-Absorbents?*

Specially prepared cotton, usually made in the form of *rolls,* used for occluding the salivary ducts and damming back the saliva. Generally used in combination with *absorbent* rolls, a section of a non-absorbent roll being placed over the mouth of the duct, when absorbent rolls are placed over it and surrounding the tooth to be operated upon.

162. In what *Lengths and Sizes* are cotton rolls supplied?

In six-inch and one and one half-inch lengths, and in diameters of five-sixteenths, three-eighths, one-half and five-eighths of an inch. The smallest size is designated as number one, the next largest as number two, the next number three, while the largest is number four.

163. Name some prominent forms of *Cotton-roll Clamps.*

Ivory, Zimmerman, Simmons. (*Fig. 88*).

164. Describe *Flagg's System* of using napkins.

A napkin four or five inches wide and twelve inches long is folded into a long roll one inch wide. For an operation on the lower *right* side, one end is placed against the lingual surfaces of the teeth of the lower *left* side; the napkin is then carried under the tongue, doubled back across the dorsum, and its other end protruded from the left side of the mouth. The tongue is then forced down, thus occluding the ducts of the lingual and submaxillary glands. For operations on the opposite side the procedure is reversed. This method is now almost obsolete, since the extensive use of the rubber cloth has been adopted.

165 What *Appliance* is of assistance to prevent accumulation of saliva in the mouth?

The saliva ejector, which drains the watery accumulation into the fountain cuspidor.

166. What is the *Treatment for Nausea* and spasmodic coughing incident to the application of the dam or absorbents?

A wash or spray of camphor water, or, in extreme cases, painting the parts with tincture of camphor.

167. Describe the *Treatment for Syncope.*

A condition simulating approaching syncope sometimes arises from the application of the dam. In this case, instruct the patient to *breathe through the nose.* If fainting is imminent, remove the dam, open the window, place the patient in the horizontal position, or anesthetic narcotic position, apply cold water to the face, loosen tight clothing and massage the wrists. If the patient be still conscious, administer one-half to one dram aromatic spirits ammonia, or one to two drams camphor water. In dangerous cases, with patient unconscious, one-sixtieth to one-thirtieth grain strychnin sulphate, or one-one hundred fiftieth grain nitroglycerine hypodermically; or break a five minim ampule of amyl nitrite in a napkin and apply carefully to the nostrils.

USE OF THE MATRIX

The word "matrix" is derived from the Latin *mater*, mother. The definition, as given by the Standard Dictionary, "That which contains and gives form to anything," is all-inclusive and descriptive of various forms of matrix, as used or seen in mechanics, the arts and the sciences, including dentistry. A dental matrix may be defined as a properly-shaped piece of metal used to support and give form to the filling during its introduction and hardening.

The use of the matrix is essential to the proper contour of proximo-incisal or proximo-occlusal fillings of a plastic nature. There are many forms of matrix bands and retainers supplied by the manufacturer, but, in special cases, the dentist often may adopt matrices of his own construction with better results.

168. Name the *Essential Qualities of the Matrix.*

First, adaptability and fixedness to the teeth.

Second, provision for proper contouring.

Third, resistance against pressure.

Fourth, capability of easy introduction and removal.

169. Who introduced the *First Successful Matrices?*

Dr. Louis Jack and Dr. Truman W. Brophy.

170. Name four *Uses of the Matrix.*

First, to act as a temporary wall of resistance during introduction of the filling.

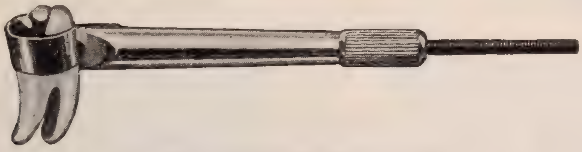


Fig. 89—The Onderdonk matrix.

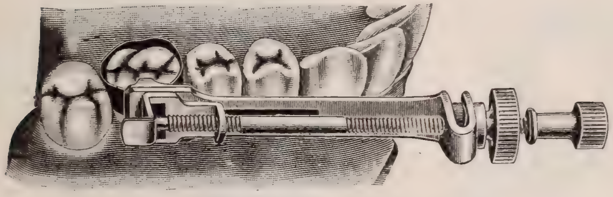


Fig. 90—The Ivory matrix.

Second, to give shape to the restoration.

Third, to maintain the form of the filling during hardening or setting.

Fourth, to hold back the gum and rubber dam during introduction of the filling.

171. Name the *Substances* of which *Matrix Bands* are made.

Steel, phosphor-bronze, copper, German silver and celluloid.

172. Name some prominent forms of *Patent Matrices.*

Ivory, Crenshaw, Hinniker, Jack, Brophy, Guildorf, Woodward, Lodge, Onderdonk and Hodson. (*Figs. 89 and 90*).

173 Mention several forms of *Matrices for Special Cases.*

First, The Soldered Band. Made by taking a measurement of the neck of the tooth and soldering a band of metal to fit. (*Fig. 91*).

Second, The Tie Band. Clamp with pliers a piece of metal around the tooth, pinching the ends tightly together. Remove and tie at the point of juncture with binding wire, after which bend back the projecting ends and place in position on the tooth.

Third, Another Tied Band. Take a measurement of the neck of the tooth and cut a piece of metal of the proper length and width. Punch a hole near each end. Pass a ligature through one hole, then along the length of the band, and back through the other hole. Place the band in position and tie to place, wrapping the ligature around the tooth several times if necessary. (*Fig. 92*).

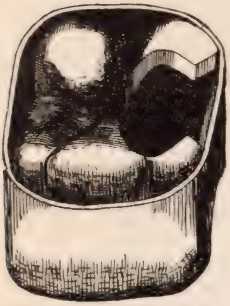


Fig. 91

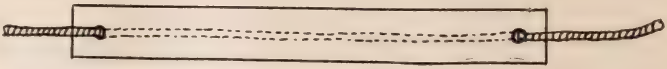


Fig. 92

Fig. 91—The soldered band matrix.
Fig. 92—Tied band matrix ready for adjustment.

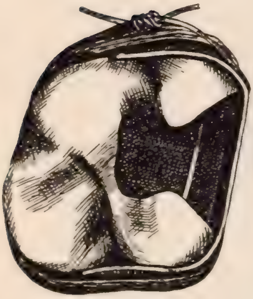


Fig. 93

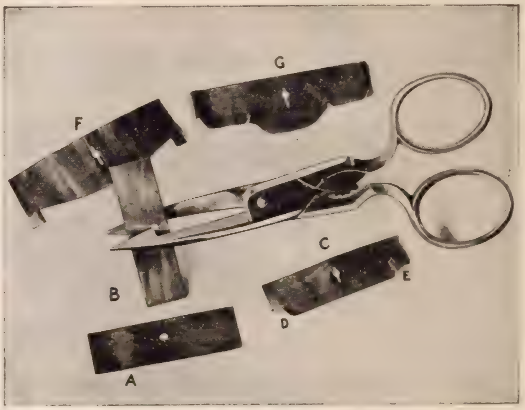


Fig. 94

Fig. 93—Matrix ligated to tooth to be filled.

Fig. 94—Steps in preparing the Crandall tied copper matrix. A strip of annealed copper cut to suitable size with hole for restoring the contact points, punched with the rubber dam punch is shown at A. At B specially-constructed scissors are cutting a slit occluso-gingivally to weaken the matrix for easy removal later. C shows a completed matrix with two forms of ears cut at D and E for holding the ligature in position. F and G show bands cut to extend below the gingival margin in extensive cavities.

Fourth, Wedged Matrix. Cut a piece of band metal of proper shape to supply the missing wall, and after ligating, wedge to place in the interproximal space with orange-wood, to gain separation, (*Fig. 93*). *Figs. 94, 95, 96, 97 and 98* illustrate the Crandall copper band matrices for amalgam work.

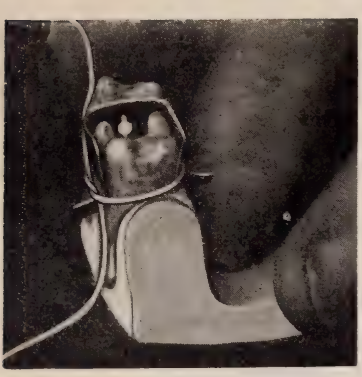


Fig. 95—Crandall Matrix in position with first tie of the ligature.

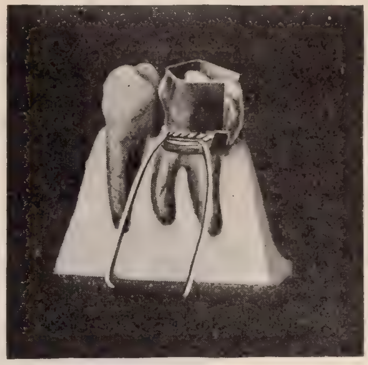


Fig. 96—Matrix ligated in place.

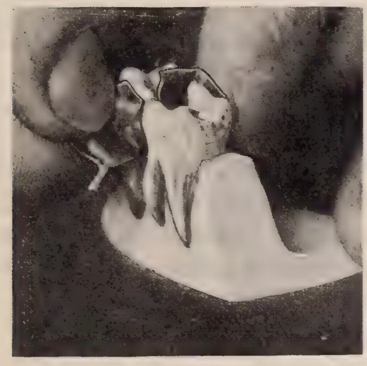


Fig. 97

Fig. 97—Removing the matrix by tearing through the slit.

Fig. 98—A, C, E, a copper matrix band ready for ligating. D, B, F, seamless copper band matrix.

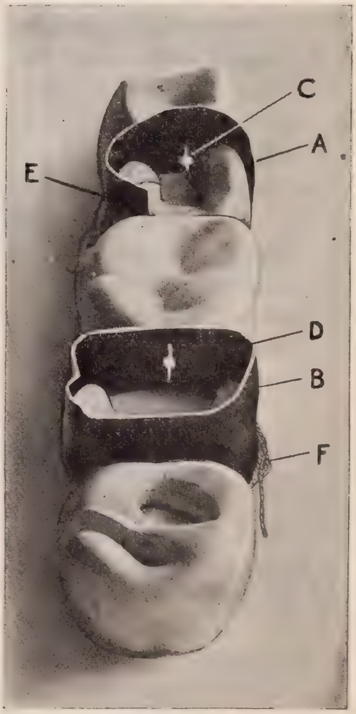


Fig. 98

174. For what *Class of Flling Materials* are matrices applicable?

Amalgam, cements (including silicate) and gutta percha. Some operators use them for gold fillings, starting on the gingival wall with non-cohesive gold, but this method is not recommended by the author.

175. What is the *Danger* in the use of the matrix for *Gold Building?*

Imperfect adaptation of gold to the margins, owing to obscuring of the light and rendering the margins more inaccessible.

176. Are Matrices used on *Anterior Teeth?*

Yes, for oxyphosphate and silicate fillings (celluloid), and the "Crenshaw" matrix by some dentists for gold fillings. (*Fig. 99*).

177. What *Important Procedure is Necessary* in conjunction with the use of the matrix?

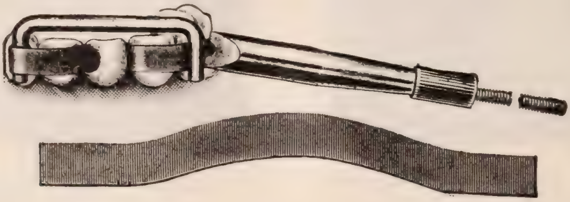


Fig. 99—The Onderdonk matrix for anterior teeth.

Separation of the Teeth, to allow for the space occupied by the matrix band, and for finishing the filling, so that contact points may be restored and "knuckled."

178. When it is desired to give a *Concave Surface* to the gingival portion of the filling and a *Convex Surface* to the other portion, as in some bicuspids and molars, how can the difficulty be overcome?

Adapt a thin sheet of annealed copper in the interproximal space, forcing it in contact with the *concave* gingival margin. Carefully remove, and fill in the concave portion with hard wax or soft solder. Place in position, and then adapt over it the usual form of matrix. (*To Be Continued*)

HISTORY, ETHICS AND ECONOMICS*

BY J. W. BEACH, BUFFALO, N. Y.
SPECIAL LECTURER DEPARTMENT OF DENTISTRY, UNIVERSITY OF BUFFALO

Owing to the limited period of college training for the dental student up to the present time, subjects not directly related to the application of practical dentistry have found little room in the curriculum of the great majority of our schools. In other words, only those subjects necessary to meet the requirements of the State Regents have been deemed worthy of the attention of the prospective dentist.

No matter how well the graduate may have been grounded in the principles and practice of operative and mechanical dentistry, it does not follow that he is prepared to go forth into the world and make proper or even creditable application of that which he has acquired by three or four years of hard work and study.

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*One of a series of articles written for THE DENTAL SUMMARY by Dental College Teachers.

In fact the forced conclusion is that he is not well prepared and in many instances the writer has observed that such young men have been seriously hindered even for years in an unguided effort to "find" themselves.

The combined subjects of history, ethics and economics are so correlated and embracing as to cover his prescribed needs and give to the graduate the requirements and essential knowledge conducive to the fullest success. It is beyond peradventure that our profession could not exist as such without its history, and the uninitiated cannot render it due respect unless they possess at least some knowledge of its fundamentals as well as of many of the events, both ancient and modern, which have transpired during its gradual development.

Knowledge of the history of dentistry engenders respect and implants a desire for personal achievement; therefore the subject demands a place in our curriculum.

No one would be so ill advised as to question the right or necessity for a comprehensive course on the subject of ethics as applied to our profession. It forms the most pregnant avenue through which the essence of professionalism may be communicated to the dental student, and through which the broader vision of his relations to his confreres, to his patients and to the public may be established in his mind.

This subject carries with it the fullest conception and interpretation of the deeper principles of our calling and no young man, albeit however capable or skillful, can attain in his professional life a high standard of excellence without the fundamental precepts and inspirational uplift interwoven throughout the fabric of our code of ethics and, although adopted in 1864 by a coterie of our sterling pioneers, its whole composition rings with a note of honorable professional conduct, consideration and humanity. Need we doubt the value or the impelling need of a course of lectures on professional ethics for our students?

Economics may well be termed the basis of practical application. The fundamentals involved constitute a rule and guide for material success. All its principles intermingle and anastamose with every phase and department of our professional service. Neglecting to give the graduate instructions in this branch would be much like attempting to navigate an unknown sea where shoals and rocks abound, without supplying the chart and compass.

It is not the intent of this short article to outline a general scheme for such a course but one might refer to a few prominent landmarks involving choice of location, equipment, bookkeeping, management of accounts, purchasing, economy, motion study, cleanliness, dress, etc. From these general headings various subdivisions are suggested embracing many topics of vital interest to the young man who aspires to travel the highway of professional success.

Professional Building.

THE LAW

BY ALPHONSO IRWIN, D.D.S., CAMDEN, N. J.

(Written for THE DENTAL SUMMARY)

IT SEEMS QUIXOTIC to call attention to the law in this cyclonic age, when man's conquest of the land, the sea, and the air, is sought with such furious energy; when didactics and erudition, systems and technic, righteousness and morality are outraged; when governments, dynasties and Deity even are defied; when long-cherished traditions, conventions and customs are ruthlessly ignored; when thought travels with the whirlwind and reaps the whirlwind's *finish*; when activities vie with the lightning flash for striking *results*; when the flash of meteoric success blinds the eye, dazzles the mind, and snares the ambitions; when the speed mad, money mad, lust mad, old world is toppling upon the brink of an abyss. For autocracy declared, and practice seems to confirm the impression, that "necessity knows no law," whereas we declare that it is *necessity* that *reveals* the law. The law existed from the creation of the human race, but we were too blind to see it until necessity opened our eyes. Hence for this reason alone, it behooves us to learn the law; and the sooner we become wise, the better it will be for us. The sooner we jam the emergency brakes on speed and pause long enough to worship at the shrine of the goddess Wisdom—even though the goddess be personified by the figure of Justice clad in the legal robe of ermine, the faster we will be able to travel and achieve lasting results; paradoxical through it may seem. The lesson taught by the fable of the Tortoise and the Hare is not obsolete. Short cuts to office, riches, or glory, are traps for a *fall.* The man has never been born who can beat the devil at his own game. Wise men build their foundation upon the decalogue. Red-blooded men "keep fit" upon the beatitudes and the decalogue; while the golden rule is the pebble flung from the sling of the legal David, that knocks the "R" out of the terrible Goliath *Revolution,* and makes it *Evolution* instead, so that the law based upon righteousness functions normally as a process of ethical development, expansion, and adaptation to the growing needs of increasing population, wealth and resources of a race. No matter what that person or race, generation or age, condition or civilization may be, the law, logically deduced, advances step by step intelligently, instead of being the offspring of brute force. Such rational evolution of the law will stand the test of time, the onslaught of adversaries and the friction from conflicting civilizations, because it is based upon *justice* to all the parties concerned. No codes of ethics ever have been devised, or can be invented by man, that will surpass the *decalogue,* because its author is *infallible.*

When we realize that permanent results obtained legitimately through the systematic acquisition of accurate knowledge only are worth the vigorous efforts of sane men; when we become convinced that success snatched from temporalities, or by force, or through foul means is fleeting and invites disaster, then and only then will the law be respected. For proof, consult William Hohenzollern, of Amerongen, Holland. You can't *hunnify* the human race. You can't coax *fiends* to become *angels*. Outlaws from Kaisers down to door-keepers must be *disillusioned* before they find this out. The law is the instrument used in the disillusionment. Megalomaniacs, monomaniacs, and kleptomaniacs must be shackled. Speed fiends, dope fiends, and degenerates, autocrats, plutocrats and demagogues, booze-tanks, educated rascals and swindlers may flourish for a time, but the final account must be rendered. If this account is not rendered voluntarily, then the law must be invoked.

Justice is the *law* applied. Retribution, remorse and conscience are the *blood-hounds* of *justice*.

But this is not the only kennel for the blood-hounds of justice; there are others. Envy and malice, gossip and slander, ostracism and scorn, mind and memory, exposure and disgrace, guilt and vengeance, are twins belonging to the same breed.

The "woods" are full of outlaws. Regicides and parricides skulk within their secret recesses; fratricides and uxoricides flee to their swamps; absconders and deserters hide in their caves; miscreants and law-breakers of high and low degree hasten to their shelter; fire-bugs and felons, forgers and frauds, kidnappers and embezzlers escape into their thickets; brigands, assassins and ravishers lurk behind the trees watching for their prey; Bolsheviki, bomb-men and black-handers plot beneath their branches; anarchists, nihilists and revolutionists hatch conspiracy within their seclusion.

Law is *justice* put in concrete form; justice is *law* set in motion. There are *dogs* of *law* as well as *dogs* of *war;* they also are loosed. Then the day of reckoning nears. The kennel doors are opened; justice must be satisfied. The law must be vindicated. The hounds of justice are unleashed; they bound forward into the open; they sniff the air; they scent the trail, the run begins; each one is frantic to lead. Other packs swell the yelping chorus. Clamour and treachery, anger and fear, hate and horror speed the chase. The noise of the deep-baying, blood-curdling, nerve-racking pursuit resounds through the forests; it is echoed by the courts, and re-echoed by the press. As the run progresses, the scent grows keener, the tracks become plainer, the pursuit waxes hotter, the *finish* appears near at hand. Eventually the game is sighted, the quarry is overtaken, the culprit is routed out of his lair and pulled down in his tracks. The hounds sink their fangs into the quivering flesh and tear the outlaw into pieces, unless the officers of the *law* interpose, when prison walls enclose him, or the electrocutionist is assigned the task of finishing the job. At last *justice* is applied, the law is *enforced*, the end *justifies* the means. The law *fits* the punishment to the crime.

The hounds typify the *passions* of men. They can be useful only when made subservient to law. The passions are the hounds harnessed by the law which whirl the chariot and outlaw driven by the goddess *Justitia*, to the goal ahead of the *mob*, where the final verdict is pronounced by the goddess, instead of Judge *Lynch*. Which do you champion, the *law*, Judge *Lynch*, or the *outlaw?*

425 Cooper Street, Camden, N. J.

OUR DENTAL ARMY AT HOME AND ABROAD*

BY COL. W. H. G. LOGAN, M.D., D.D.S., CHICAGO, ILL.

THE WORLD WAR called to the American Nation, in April, 1917, and found it deficient in every needed commodity save brave men and brave women. The World War called to the dental profession and it responded with five thousand officers in uniform. Fifteen hundred had accepted commissions and awaited assignment, and two thousand more had completed applications for commission when hostilities ceased on November 11, 1918.

Approximately twenty thousand civilian dentists banded themselves together in a patriotic organization known as The Preparedness League of American Dentists, giving part of their time to the end that the boys who had been accepted for military service should arrive in camp with their teeth and mouths in as good condition as circumstances could permit. Thus we find that eight thousand, five hundred dentists gave the Nation opportunity to make such use of them as they saw fit, and twenty thousand more gave part of their time without compensation—making a total of twenty-eight thousand, five hundred of our fellow practitioners going to the aid of the Government. This total constitutes nearly two-thirds of all the practitioners in this land. Of the five thousand dental officers on duty, Ohio furnished one hundred and seventy-five and had sixty-seven holding commissions awaiting assignment.

The dental officers of Ohio made a creditable showing in camp and field service, in base field and evacuating hospitals, as teachers in the Dental Officers' Training School at Camp Greenleaf, Fort Oglethorpe, Georgia, and, as the military representative in the main office of the Preparedness League located in New York City. As evidence that the foregoing fact is not a generalized statement that might be applied to the dental officers from any locality, I take the privilege of reminding you that the government saw fit, when selecting professional instructors for the Dental Officers' Training School at Fort Oglethorpe, to assign Majors G. P. Bannister and E. B. Lodge. Captain G. B. Gentilly became military director of The Preparedness League of American Dentists upon the assignment of Major W. A. Heckard as Camp Dental Surgeon. Majors B. L. Rothwell, Allen MacLachlaw and Wm. G. Sykes, three of the first five dentists commissioned and assigned before June 1, 1917, came from Cleveland and proceeded overseas with the Lakeside Base Hospital Unit. One of the efficient dental oral surgeons connected with the surgical head group of thirty-eight sent overseas for observation with subsequent assignment in plastic and dental oral surgery, was Major S. D. Ruggles. This war developed or gave opportunity to less than a half-dozen plastic surgeons to render outstanding service in maxillo-facial surgery, and one of the most efficient of that small group came from this city. I refer to Lieutenant-Colonel G. C. Schaeffer, a member of the Medical Corps.

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*Address at a banquet given by the Ohio State Dental Society in honor of Col. Logan and Society members who were in the service.

Not only did Ohio play an important role in dental and medical military activities, but also in semi-military organizations she proved her patriotism. The Ohio Unit of the Preparedness League of American Dentists was one of the largest and best organized groups in the United States—with the end result that the men selected for military service from this state received as much, if not more intelligent gratuitous dental service from civilian dentists than those in any other state in the Union. If I am not in error, a great deal of the credit belongs to the organizing ability of Dr. Frank M. Casto, president of your state society at that time.

It was a sub-committee appointed by the Cleveland Unit of the Preparedness League that developed the plans accepted for the dental motor ambulances and the first one presented to the government came from that unit. The major part of the credit for designing this practical and ingenious car belongs to Dr. S. M. Weaver, of Cleveland.

The three dental schools of Ohio complied with every request made by the Surgeon General on behalf of the government, and whenever the dental division in the Surgeon General's office had need of a conference of dental deans of this Nation, I am pleased to have it recorded that Deans Semans, Casto and Smith traveled to Washington and stayed as long as was necessary that the cause of dentistry should write a brilliant and patriotic page in the World War, regardless of what might happen to their dental institutions.

The dental committee of the General Medical Board of the Council of National Defense played an important part, assisting the Surgeon General's office in securing a sufficient number of dental officers to fill the demand made upon it by the Adjutant General's office in September,

1917. The dental committee of the General Medical Board was composed of fifteen members, and here again Ohio furnished more than its quota, as you were represented on that committee by Drs. Weston A. Price and L. L. Barber. They always were in attendance at the meetings held in the city of Washington. Both of these men rendered most efficient service.

The Dental Reserve Corps of the United States Army was built up in a different manner than any other arm of the military force. The Surgeon General's office appointed about one hundred prominent civilian dentists throughout this Nation to assist them in giving the professional examination required by law, to any applicant desiring commission in any branch of the army. Of these one hundred preliminary dental examiners, Ohio furnished five—the dean of each school, the president of the National Dental Association for the year 1917, and Dr. R. H. Vollmayer, secretary of the state examining board. The need and value of the preliminary dental examiner's service can best be understood if I am permitted to inform you that up until June 1, 1917, or the date of their appointment, only five dental officers had been commissioned; and, two months later, or to be more exact, on Labor Day, one thousand dental officers were selected and their stations for duty designated. The selection of one thousand assignments in a single order constituted in numbers twice the size of the combined strength of the Regular Medical Corps plus the Dental and Veterinary Corps on the date we entered the war. All this was made possible by the intelligent gratuitous service rendered by every member appointed by the Surgeon General's office as preliminary dental examiners.

When we entered the World War the Regular Dental Corps had a total of eighty-six officers, eighteen of whom were captains and the remainder first lieutenants. The law then permitted only eight officers to advance to the grade of major after twenty-four years of service, regardless of the number who might have been eligible. As result of united action on the part of the dental profession, the Army Dental Corps and the officers of the National Dental Association for the year 1917, a law was enacted on October 6, 1917, which gave to the Regular Dental Corps of the Army the same grades and percentages within the grades as were then or might thereafter be authorized by law for the Regular Medical Corps; and it also was enacted that dental students should be treated similarly to medical students with reference to being permitted to complete their education before being called into military service.

In reference to the question of legislation, Ohio again took an important part, as the president of the National Dental Association and the chairman of the legislative committee both deserve and have received special recognition on behalf of the dental profession for the intelligent efforts they put forth for this important legislation. I refer to Drs. Homer C. Brown and L. L. Barber.

I have referred to your military officers and a number who have been associated with semi-military organizations in the state of Ohio. I now desire to call your attention to the service rendered by a member of your State Society who played an important part in the upbuilding of a splendid dental service in the military camp at Chillicothe. I doubt if any of you know and I am sure he is unaware that the authorities in Washington had full knowledge and greatly appreciate what he did to assist in organizing one of the very best dental services in any camp in the United States. This dentist gave freely of his time and counsel, that the thousands of men trained at Camp Sherman might receive the very best type of dental service, and that the medical profession should appreciate and co-operate with the dental officers in the Base Hospital. I always have felt and now desire publicly to state that it was my official and is my personal opinion that this dentist rendered a patriotic service during the World War, to which you as a profession may point with great pride. This individual did not wear a uniform, but proved his one hundred per cent. Americanism by his daily acts during the entire war. His name is Dr. Charles W. Mills, the president-elect of your Association.

If I were called upon to state the contribution of the Ohio dental profession in the World War, I would simply acclaim that it had lived up to the standards set by the founders and builders of the dental profession of this commonwealth; for surely you officers and you civilian practitioners have emulated the noble deeds and professional work accomplished by Drs. Rehwinkel, Jonathan Taft, Miller and Callahan.

Before leaving the military aspect of my subject, both the propriety and justness of the theme demand that I again call your attention to the fact that the brilliant record written by the dental profession could not have been accomplished had it not been that the dental division in the Surgeon General's office, had the hearty and sincere cooperation of the dental educational institutions of this country, the dental examiners of each State, the officers and entire membership of the National Dental Association and the editors of the Dental Journals.

For fear that some of you might not understand the importance of this co-operation, I wish to urge upon every dentist in all this land to transfer that enthusiasm and willingness to respond to every request I had occasion to make while in charge of the dental service in the Surgeon General's office, to the officer of the Regular Dental Corps who has now taken over that responsibility. In times of peace as in war the Dental Corps in the army will have need of counsel and assistance; and if you were permitted to know the personnel of the Regular Dental Corps as I grew to know it, you would agree with me that they are eminently entitled to the support I seek for them.

Yes, stand back of them and their new chief as you stood back of me, encourage them not only by acts but by deeds. If you do not they will not be able to develop that service up to the opportunities of the times. The dental profession and the Dental Corps should congratulate themselves and Surgeon General Ireland for having placed in charge of the dental division an officer who has rendered the longest dental service—one whose record is untarnished, one who always has had the best interests of his Corps at heart and one who rendered outstanding service in the war just ended as the officer in charge in France. Therefore, I am sure you will agree with me that I am justified in asking that you give Colonel Robert Oliver the co-operation you gave me during the recent war.

Before concluding, I ask, Mr. Chairman, that I be permitted to say a word in my own behalf. *First*, to the president of the Ohio association and to the committeemen under whose direction this gathering has been assembled, to many of you who have spoken so kindly of my activities in connection with my military service, and to each of you, permit me to convey my profound and sincere appreciation of your coming here to welcome the Ohio dental officers and myself as your guests on this occasion. Many men of this Society have been most kind in describing the varied activities in which I have been engaged for the past two years, but for fear that a few of you might be led to believe I was largely responsible for the success obtained, I desire definitely to affirm that if the cause of dentistry had not been fully appreciated by those in the Surgeon General's office, and by the chairman of the General Medical Board Council of National Defense, much of the rapid growth of the dental service in the United States Army would either not have been accomplished or would have gone forward much more slowly. Therefore, in the future when members of our profession or others have occasion to mention the names of those largely accountable for the splendid dental record written in the World War, please remember to include among the foremost the names of General Gorgas, General Ireland, General Noble, Colonel Martin, Colonel Miller and Lieutenant-Colonel Coulter. For if any of these officers had been antagonistic or indifferent to the worth and advance of dentistry many of the things that have been mentioned could not have been described as accomplished. I ask you to see to it that dental historians include their names as individuals among those responsible for our present dental legislation as well as aiding dentistry to develop along educational lines.

And now a word to my associate officers. Most of you went away as boys and all returned full grown men in heart and mind. You have learned to look upon the affairs of life from a new viewpoint and you returned to find that those in your home community also have a new viewpoint. Although in most cases you were received upon your return home with a true welcome and often with affection, yet the community had learned to function without you. In many instances you found your old office occupied by others and frequently suitable space was not available in the immediate vicinity. You have been surprised while mingling with your former professional associates that they discuss now more than formerly, the question of larger fees, and less frequent than formerly, the question of giving increased service for the increased fees. You have been startled undoubtedly with what seemed to be a great display of extravagance, and ofttimes you have lost heart and enthusiasm to enter into the strife to the degree necessary to re-build and re-establish yourself in your old location; but I say to you, enter into this work of re-building and re-establishing yourself with the same eagerness and enthusiasm with which you left it at the call of your Government. Be not discouraged because of the apparent fact that some of your associates and old patients seem to have forgotten that there has been a war. Continue to occupy your mind by living your life as a civilian as you lived it as an officer—meaning with the exactness, cheerfulness and determination to give the best that is in you at all times. Be sympathetic and kind to those entrusted to your care and absolutely honest with yourself; and then I shall not and you need not be anxious nor fearful as to your future success. For I believe an individual can attain all those things which he makes a demand upon himself to accomplish; for if one wants anything in this world positively enough and long enough, nothing short of death can prevent him from securing it unless he loses courage. All of this providing one is willing to pay the price by conscientious application, and what is more—

"If you can make one heap of all your winnings
And risk it on one turn of pitch-and-toss,
And lose, and start again at your beginnings
And never breath a word about your loss;
If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the will which says to them "Hold on"!
If you can talk with crowds and keep your virtue,
Or walk with Kings—nor lose the common touch;
If neither foes nor loving friends can hurt you,
If all men count with you but none too much;
If you can fill the unforgiving minute
With sixty seconds worth of distance run,
Yours is the Earth, and everything that's in it,"
And—which is more—you'll be a man, my son!

On semi-military occasions of this kind much is always said of the part men play, but little of the important role and influence of the women. Therefore, let my final statements be with regard to the ladies. For in all ages woman has been the source of all that is pure, unselfish and heroic in the spirit and life of man. Back of every human act may be found the influence of the love of a woman. It was a distinguished

French philosopher who answered the narrative of every event with the question, "Who was she?" Allow me to assure you, ladies, if such assurance is needed, that no inspiration, no important achievement, no great and noble ambition is entertained by any man in this room which has not its direct relation either to a mother, a wife or a wife-to-be. From the hearthstone where lingers the recollection of a mother, from the fireside where the wife or wife-to-be awaits us, come all the purity, all the hope, all the courage with which we fight the professional battles.

The thought I wish to leave with you men is to strive not more for the applause of the world and the profession than you strive for the more important and precious approval of your home.

The thought I wish to leave with you ladies in this time of equal suffrage is not to strive nor glorify in the thought that you are our equals—God did not intend you should be so; he did not make you that way. You were designed to be as you are and always will be—our superiors.

29 E. Madison street.

AFTER DINNER TOASTS

Major Bannister: I think those of us who had the pleasure of having Camp Sherman as our first assignment, know the war in a little different way from some of the others. Most of us were young men. We had had no previous military service, and our leading officer had not. So your help and your counsel meant a lot to us in those days. I know Major Sherrard so felt, because he often spoke about it. We stayed at Camp Sherman for some time. One of the hardest things in the army is to form friendships, and then be ordered away and have them broken. Some of us were sent to Camp Greenleaf, others were later sent to France and Italy. We were associated at Camp Greenleaf for seven months, and made some very warm ties. On going to Oglethorpe there were several of us who thought it would be well to go down early and see what we thought of the place. We went out to camp. We were first lieutenants at Camp Sherman, and it carried quite a lot of distinction there. We went to Camp Greenleaf and went out and reported to the commandant of the camp, and we advised the adjutant we had come out to register and would go back and spend the night at Chattanooga. That did not agree with his view, and he sent us to the barracks. A few days later another one of our friends showed up. Some of us were rather anxious about him, and we said, "Where have you been these last two or three days?" He said, "I have been seeing America first". (Laughter).

Upon our reporting to battalion headquarters we were assigned to barracks, a nice building of one room, plenty of hospitality and a place to put our cots. The first greeting was, "Take those bars off. You wear those on Sunday." We complied. The next order was, "Scrub your cots." This was Thursday, Saturday was inspection. We got our cots cleaned up ready for inspection. Following that was picking up cigarette butts and cigars, working the company street. They were very particular about that street, and all those things, with enough drilling to prevent your being stiff. I had a letter from one of the boys who reported from St. Louis. He said, "Well, we thought that third battle of Chattanooga was pretty tough, the one of '63, the one of '98, and ours," but as I look back on it, those were happy days. We had some disagreeable experiences, but they are pleasant to look back on.

No one seemed to have much interest in Camp Greenleaf. In Camp Sherman the people of Ohio stood back of Captain Glenn. That was not true of the medical officers' training camp. A man had to give his life down there for the officers to have an auditorium to meet in, erected by the boys' mothers. When it came time for the dental course, buildings were scarce. We would find a place, and be run out, and would then find another. However, things became better organized, and we were located and were running very nicely at the end of the war! Those were local conditions and were met in all of the camps. We thought possibly Colonel Logan might have given more of his time to Camp Greenleaf. Along about the first of January some of us from Greenleaf were ordered to Washington, and I was one. I did not appreciate at the other camps the amount of work, the long hours, the obstacles, and a thousand-and-one things that our leader had to contend with in the Surgeon General's office. Not knowing the conditions there, it was quite different when I had a slight acquaintance with them. To increase the Corps from seventy-eight to five thousand was quite a task, and you must remember that prior to his going there the Dental Corps had practically no head at all. I want to thank those of Ohio who were pioneers in the securing of laws for the Dental Corps. The boys who are wearing silver leaves now had a lot of difficulties to meet. To be a contract dental surgeon was humiliating many times. One of the most unfortunate affairs of the army is rank, although it is probably very necessary. We were fortunate in having as the head of our department a full colonel of the Corps. He is constantly coming in contact with men in the Surgeon General's office, and it is important that he carry a high rank.

Colonel Logan spoke of the many good things the dentists of Ohio did, but he has not mentioned the fact that although wanting to go to France, he stayed here, stuck by the ship, and only after the war was over did he go abroad for a couple of weeks. That speaks for itself.

General Gorgas, in his visit to the Chicago convention went, not as general, but as Surgeon General of the army. I have wondered if the Dental Convention appreciated the significance of his trip there during the trying days of August, 1918. The Surgeon General's office was a very busy place. Colonel Logan was held in highest esteem by the higher officials. Colonel Logan has served us well, and a great deal is due him. Of all the investigations made I have heard nothing of Congress investigating the Dental Corps.

We are glad to be back, and we appreciate all the good things you have done. As has been said, I hope you will stay back of Colonel Oliver, for there are things coming up continually in which he may need help. Now the Dental Corps is responsible only to the Surgeon General. Even though the war is over, let us not forget we have an interest there, for the Corps will need our support.

MAJOR SYKES: I have enjoyed this fellowship tonight. After two years of life abroad amidst the horrors and excitement of war it seems good to be back again enjoying the privileges of a sane and normal existence. While the war was on in full swing, such a gathering as this was quite beyond all possibility "over there."

It was my privilege to be attached as a member of the staff of Base Hospital No. 4, sometimes known as "The Lakeside Unit," from the fact that the doctors and nurses were recruited from the personnel of Lakeside Hospital, Cleveland, Ohio. There were three dental officers included in the roster of our unit, the others being Major B. S. Rothwell and Captain Alan MacLachlan. Naturally, we are just a little bit proud of the fact that Base Hospital No. 4 was the first outfit of the entire A. E. F. to get across. The reason was—we were prepared. Colonel Crile had been overseas in 1915 with the American Ambulance in Paris. He returned with the conviction that before the war could come to an end America would be compelled, for humanity's sake, to cast in her lot with the Allies in their struggle against the powers which sought to overthrow the democracies of the world. As a result of this conviction he organized the Lakeside Unit and offered its services to the government should the crisis arrive which he foresaw. The government accepted his offer, after much persuasion; and when, on May 5, 1917, the call finally came, we were ready. We got away in a hurry. Some of us were on our way almost before we knew it. We sailed from New York, May 8th, aboard the good ship Orduna of the Cunard Line. We carried the flag to England and were the first to plant it upon the soil of France. This was on May 25,1917. Thus Ohio scored another hit and added one more laurel to her wreath of fame. Somewhere I have read this epigram: "Some men achieve greatness, others have it thrust upon them; while others are born in Ohio." I thought of this as I passed through the State House yard this morning and saw the statue representing the historic Roman mother bending over her sons saying, "These are my jewels."

Ohio truly acquitted herself with honor during the dark days of the Civil War and she has not done less during the recent world crisis. She is more than the mother of presidents. She is the mother of countless sons and daughters who gave their all, actually or potentially, during this great conflict that government of the people, for the people and by the people might not perish from the earth.

Being the first representatives of the American forces to reach the shores of Europe, our unit was greeted with great acclaim. Honors of all sorts were heaped upon us. The people of London were very friendly to us. Everything was done to make our brief sojourn there most enjoyable. We were signally honored by being received at Buckingham Palace by the King and Queen and by the Prince of Wales and Princess Mary. This was not so much a formal affair as a cordial personal greeting. And as the King took each of us by the hand, we felt that he represented the sentiment of the entire Empire when he said, among other things, "It is characteristic of the humanity and chivalry which has ever been evinced by the American Nation that the first assistance rendered to the Allies is in connection with the profession of healing and the work of mercy."

Base Hospital No. 4 served with the British throughout the war. We were an American Unit brigaded with the British, as was the entire Second Corps, including several thousand fighting men and five other hospital units such as ours.

After six delightful days spent in England our outfit entrained for Southhampton where we boarded the Western Australia, a very smelly hospital ship, crossing the channel at night. It was very calm, an unusual thing for the channel, and as the submarine menace was very acute at the time all lights were extinguished and we were crowded down below decks. All portholes were closed, everything battened down and absolute quiet enjoined. It was a tense and trying experience. Fully dressed and attired in our life preservers we waited below in silence for the signal that we were out of danger. Though we could not see them, we knew that we were being convoyed by subchasers, and this was somewhat reassuring. Finally about four A.M. we arrived inside the submarine nets at Le Havre, when we were permitted to go on deck to get a breath of fresh air. While waiting for the tide we snatched a few hours of rest. At ten o'clock we weighed anchor and began the journey up the Seine. It was a glorious day: "Apple blossom time in Normandy." The river winds and turns in a constant succession of the letter S, each turn affording a new and more attractive picture. We passed village after village straggling along the river's course or partly hidden amongst the hills which border the Seine. The peasants upon seeing "Old Glory" floating from the side of the little steamer would hastily disappear into their shops or homes only to return in a few moments waving their tricolors and shouting vigorously, "Vive La France, Vive L' Amerique." It was a reception whose sincerity we could not question.

At six P.M. we warped up to the quai at Rouen, our destination, where we soon disembarked. We were greeted here by the most motley crowd I ever saw. I am not going to quote scripture as some already have done tonight, but only refer to the scene at Pentecost. In so far as the bable of tongues is concerned it might have been a reproduction of that historical event. There were present Colonials from all over the British Empire and from all parts of the French Republic and their outlying island possessions. All in different uniforms and with every variety of complexion—yellow, red and white. Each one greeted us in his own tongue. It was an experience never to be forgotten.

Each seemed to vie with the others as to who would give the Americans the heartiest welcome.

Formal exchange of courtesies being over, we formed in line to begin our march of six kilometres out to camp. American tourists were not new to France but Americans in khaki were a curiosity. The French were much impressed by the snappy appearance of our nurses in their natty unfiorms of dark blue and their scarlet-lined capes thrown jauntily back over their shoulders. They had drilled every day coming across on the steamer, and as they swung along in column of fours, in perfect alignment, they merited as well as received many a hearty cheer.

Leaving the boat and marching up the hill we passed a Canadian hospital. They gave us a cordial welcome in our native tongue which made us feel quite at home. The English, as well as the French and the Canadians, were on the lookout for us. We were wondering what their impressions of us would be and we were ready to form our impressions of them. This national "better than thou" spirit is as human as it is worldwide. It had a habit of cropping out every once in a while during our sojourn "over there." We are all of us more provincial than we usually are willing to admit. However, no matter what our first impressions were, ultimately we became the best of friends. We learned to appraise at their real value all the best qualities and to discount literally each other's faults.

I recall an observation made by one British officer shortly after our arrival—an observation very commendatory to us as a people. He said, "One of the first things we noticed as you men marched around the corner into the hospital compound was the row upon row of nice white teeth. We never before saw so much clean white ivory as your broad smiles revealed." I think he was right. I often have wondered why the British had not succeeded in licking the Hun and why the Yank finally enabled them to put it over. A look into the mouth of the average British Tommy might suggest a reason. Napoleon is credited with the statement that an army travels on its stomach. That may be a very true statement but it is also a fact that its stomach will not get it very far if it is not reinforced by a good set of teeth. I never have seen such poor teeth as those Tommies had. There is a great need for dental prophylactic propaganda in Britain.

But to resume—our march of six kilometres finally brought us to our destination, General Hospital No. 9, B. E. F. This was, as time afterward proved, to be our home for nearly two years. We were received very cordially by our English friends, assigned to quarters and soon made ourselves quite at home. It took us some time to familiarize ourselves with the details of conducting a military hospital, but gradually we adjusted ourselves to the new and strange environment until at last the British staff, which had been in charge of the hospital for over two years, relinquished control and turned the work entirely over to us, only the registrar and the quartermaster remaining.

During our twenty-two months service at this post, we cared for a large variety of cases, both surgical and medical. The records show a total of over eighty-two thousand patients. About forty-five hundred of these were Americans. The number of cases terminating fatally was five hundred and twenty-eight. Not a bad record, considering the serious condition in which the majority of the men were upon arrival from the Casualty Clearing Stations. There were times when we were simply overwhelmed with wounded. Day after day the major part of the twenty-four hours would be spent in the operating room. Sleep was almost out of the question. The wounded men were the first consideration. The heaviest work came during the summer and autumn of 1917, again in the spring of 1918, when the Germans made their "break through" and at last, during the days of fierce fighting which marked the close of the conflict.

The majority of the unit remained at Rouen throughout the war, although quite a number of us were privileged to be assigned for temporary duty as members of surgical teams at front-line hospitals in Flanders and at various points along the Western front, including the Argonne. These experiences were often in the nature of a "close up." Being shelled by day and bombed by night was not an unusual experience. The wounded were brought to these hospitals directly from the battlefields, gruesome cases many of them, the kind that one never saw at the Base. The sight of so much human suffering and misery was most depressing. War is such a wasteful business, both of life and property! I doubt if one can find many avowed militarists among the ex-members of the A. E. F. They have seen enough of war.

From a mere professional viewpoint the experience was of great value. Clinical material there was in abundance and many valuable theories were demonstrated. New lines of treatment were worked out and humanity will benefit for years to come as a result of the experiences in these military hospitals. Plastic surgery made wonderful strides and the dental surgeons contributed a large share in the advancement made in this field. Still the utter uselessness of the whole affair would press itself home upon one's mind until one came to both hate and detest the selfish and brutal nation which had plunged the whole world into this terrible conflict and made all this suffering necessary.

However, since the war was a reality, I am glad that I was permitted to have a part in it. Thankful also that it was my privilege to go overseas where I could be of some service to our wounded boys. I cannot look upon my going as in any sense a sacrifice. The real sacrifices were made by our loved ones who remained at home enduring the suspense and anxiety of those trying months. They are the ones who should be honored but whom we hear the least about. "Over there" we lived on excitement, were constantly kept keyed up by our work and the consciousness that we were doing our bit to win the war. Thus I cannot call it a sacrifice but rather a privilege. I am glad I was permitted to go and perhaps just a little happier to be at home again.

CAPTAIN LOCKRIDGE: Among the good things in the army is the magnanimity of the United States government. It is the only institution I ever have known that was willing and eager not only to pay your expenses, but to send you to school and pay you for your time. In the winter of 1917-18, I had the privilege of attending one of the schools of St. Louis, and not long after that of going to still another school. One of the bright spots in my whole experience was on the occasion when we had a visit from our guest, Colonel Logan. Not long after that I had the good fortune to go overseas, and within two months from the time of our arrival in France, the armistice was signed. However, we had ample opportunity to practice the profession of dentistry among not only the wrecks of men that were sent there for treatment, but we had opportunity with the thousands of men that came there not primarily for dentistry. The last three months of our experience in France was in carrying on an institution unique in the history of the world, the A. E. F. University at Bonne. At that university we had ten thousand students for a period of three months. We utilized the hospital buildings which consisted of one hundred and sixty buildings of cement and brick, buildings that had been used as wards for the wounded and sick. We had a square mile of territory and six miles of streets. Everything was taught in that university from bacteriology to agriculture. Not only the sciences taught in every university were taught at Bonne, but we had a course in law, one in engineering and one in dentistry. The one in dentistry was a course designed to do credit to the dental profession. Practically all the studies taught in the dental college were taught there and taught well. The period was brief, but when you have two and a half million men in France that had to be transported to America, you see it was impossible to get them home all at once. Those men were men who, if they had been at home would have been at school. This institution was designed to help these men to occupy their time and maintain their morale. The most trying thing we had to contend with in the army was the inability to secure supplies. During the last month of my stay in France, I was at a rest camp where there were four hundred similar officers under orders to be transported home, but were simply waiting in enforced idleness for such time as their names might be posted on the bulletin board for transportation home. So our chief occupation was watching the bulletin board. Uncle Sam was very generous. During those oppressing days he provided the officers with automobiles and guides, and allowed us the rare opportunity of visiting historic points within a radius of twenty-five or thirty miles. Those visits were delightful.

DR. JOHN F. STEPHAN: I want to say a word first about the Red Cross, and what that has meant in this great world struggle. The Red Cross is the world's international ideal of mercy. It was the first in the field. To quote our President, "You cannot give to the government. It won't accept it. There is a law against it. The only thing that the government will accept is a loan and duties performed, and your great channel for giving is the American Red Cross." Major Sykes has spoken of the organization of the first Red Cross Unit that went overseas, Unit No. 4 of the Lakeside Hospital. Colonel Crile was the instigator of that great movement, which was put through the Red Cross, because the government could not accept gifts. All gifts were made through the Red Cross and by the Red Cross were loaned to the government. It was for that reason that the Preparedness League of American Dentists passed its aid through the Red Cross, and thence to the government. All of our ladies who knitted socks and sweaters, made surgical dressings, and did many other services for the Red Cross, were rendering those services through the Red Cross to our government. The services of these people who got behind you men who went in person must not be forgotten. The people who gave of their means to the Red Cross should be remembered. It is said that out of the one hundred million people, one in two, men, women and children, gave money to the Red Cross.

The first hospital unit was organized in Cleveland. They had less than a week's notice. The dental department had no equipment. They came to me and asked whether I could assemble such equipment. I had half an hour's notice. I went East, made six trips back and forth from Philadelphia to New York, and three back and forth from Cleveland to Philadelphia. We had no money. All we had was credit. The manufacturers in the East put their establishments and their factories and office forces at the disposal of the Red Cross. At that time there was no distinct sentiment of patriotism in this country. There were no plans. I want to pay tribute first to the S. S. White Company, who placed their entire office force at our disposal. Mr. S. S. White, Jr., one of that long line of men who have served this profession so well, was placed at my disposal, and through him the rest of their entire department served the Red Cross Unit No. 4 in giving them a splendid equipment. There was no authentic list at that time. Dr. Kirk was in New York compiling that list with others interested. He came back, and I took without leave the proof from his office, he not being there, and with that proof made out a list that was ten times the quantity the army required for any army unit. When the list for Hospital Unit No. 4 was completed, there was not another outfit to be bought, the market was stripped. That was the situation we faced at the beginning of the war. We could not learn the kind of current used in France, but we learned there were three different currents used, one in the north, one in Paris and one in Marseilles. Our guess fortunately happened to be right. I wired the S. S. White Company that I would be there one afternoon, and wanted to see the manager of the factory. They had dismissed all of their factory hands. When I put the matter before him, he called his men together, they worked Saturday afternoon, all of Saturday night, all day Sunday, all Sunday night, and Monday morning at eleven o'clock we held the train from Philadelphia to New York in order that the boxes might reach the train in time to be put aboard the boat that went the next night. Those boxes went as personal baggage by the courtesy of the president of the Pennsylvania railroad. You will remember at that time there were no orders of priority. That made it possible that these things might go on ahead of the civilian baggage. I tell you these things simply to place before you something of the attitude of the public at that time. There was no enthusiasm for these things.

The work of the Preparedness League of American Dentists is another thing we must not forget, the way in which they took care of the enlisted and drafted men. Ohio quickly got into the field because of the excellent organization of our state society. It was easy for president Casto to put his finger on the pulse and notify every component society that this thing was about to happen, and we must get into it. Taking care of the drafted soldier was work as honorable as any that could have been performed.

In connection with our examining board work, it was amazing to see how some fathers would discredit the intelligence or ability of their sons to serve their government. I remember, however, one young man who had had an accident, injuring his skull. He was unable to read or write, except that he could copy his name after you, but when told that he would not be able to enter the army, immediately wanted to fight his advisor.

Twenty times more money was spent by the northern states in recruiting the army in the Civil War than was spent by the Nation in this same way in this Great War; that is, in the recruiting. The sacrifices of the men held in the home camps were none the less great than those of the men who went abroad, for they were ready.

We are grateful for the test placed upon us as an entire people united in hearty support of the War, and we have satisfaction in the revelation that a peaceful nation can be relied upon in time of national danger to devote itself to the task of raising a defensive army. We hope that same devotion will extend through the present trials which precede a lasting peace. We hope that the labor unrest will be short-lived.

I remember entering the room of a boy. The head of the family was a successful lawyer, and I saw there a motto that impressed me greatly, "Oh Lord, make of me a good loser." And I have thought of the men who entered the service. They often must have thought they were losing much, but I am quite sure that out of their sacrifice there will come great things, as great things did ever come out of struggle. There has been civic betterment, and there has been the levelling of cast, the destruction of differences, not only among the ruling classes, but in the religions of the world; and we find coming out of it now this great movement for humanity shown in the conference of the professions recently held in Detroit, from which will come a counsel to determine the best means of helping the people at large, helping our communities, our states and our government.

There have been placed on the table tonight pieces of paper with a pin attached. Some of us have wondered what that might mean, and it is hoped that many of us will write our names and addresses upon this paper and pin a one dollar bill to it, and thus become a helpful member of this large and helpful organization.

We are tonight honoring not only the men in the service, proud as we are of them, but those who never got over; we are honoring the men behind the gun, and the women that made it possible that this great army should operate successfully. We are honoring ourselves also in having the Leader with us tonight. We need only remember the honor in which he is held by his own people at home. He wears on his finger a ring set with a gem of great price, brilliant, brilliant with the love and esteem of his own co-workers, the people in his own city, who upon the fiftieth anniversary of the Illinois State Dental Society presented him with this ring; and, as I said to him recently, I never saw him discomfited before. It was to him a great surprise, and must have been a great joy, that ring, a gift of those for whom he has labored so faithfully and assiduously. On another occasion it was my privilege to be present when he was presented as the retiring president of the National Association with a silver service, and that was an emblem of the esteem of the men he had worked with throughout the Nation.

Colonel Logan, the place to which you were called was one no man would seek, save in the performance of one of the highest and most patriotic duties. Your greatest reward will be the knowledge that at great personal sacrifice you rendered your country and our profession an indispensable service in a matter of utmost moment.

A MICROSCOPICAL DIAGNOSIS OF VINCENT'S ANGINA AND TREATMENT*

BY HARRY F. GRAVELLE, D.D.S., MARION, INDIANA

CHARACTERISTICS OF VINCENT'S ANGINA

The characteristics of Vincent's Angina is the formation of ulcers on the gingivæ, buccal mucosa and soft palate, in the region of third molars, where pockets are formed by overhanging tissue of unerupted third molars. Odor is fetid. Appears very much like syphilitic patches, occurring upon the mucous membrane and in some instances has been taken for a very bad case of pyorrhea or syphilis. Bleeds very easily upon removal of whitish tissue of white pseudomembrane.

DIAGNOSIS

Make smear from throat, as well as free saliva, will be found to contain many organisms of two characteristic types, the spirilla and the long fusiform bacilli, usually both of these types are found together but occasionally the spirilla are absent. The spirilla usually measures from thirty-six to forty microns in length and one-half micron in breadth, while the bacilli are six to twelve microns in length and are somewhat thicker in the center than at the end.

STAINING SPECIMEN

The organisms may be readily stained with Loffler's methylene-blue, gentian-violet, or dilute carbolfuchsin. Supposing everything, such as slide and platinum loop mounted on glass rod is sterile and clean ready for smear. After passing platinum loop through flame, proceed to obtain smear from ulcerated surface, smear it thinly upon the slide, pass slide over flame enough to dry specimen on slide, strain with staining agent by pouring agent over slide and allow it to stand for a while, or two or three minutes is sufficient time, then wash with water and allow it to dry. Specimen is ready for examination; using the oil lens of the microscope.

TREATMENT

Remove all tartar, ill-fitting crowns, tissue overhanging or forming pockets around unerupted third molars, broken-down roots; fill all cavities. Use some good mouth wash. Dry ulcerated areas, apply ten per cent. solution silver nitrate to surfaces of ulcers and for the deep seated spirillum and bacillus use trichloracetic acid. Many agents are used and bring splendid results; such as methylene-blue, methyl-violet, salvarsan and phenolsulphonic acid; for the spirillum and the associated fusiform bacillus are recognized as the causative agents of the disease.

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*Given as a clinic Indiana State Dental Society, May, 1920.

SUGGESTIONS

CONDUCTED BY F. R. CHAPMAN, M.S., D.D.S., COLUMBUS, OHIO

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

For Ropy Saliva

Before taking the plaster impression, it is well to have the patient wash his mouth to free it from excess saliva. Ropy saliva is particularly objectionable. A wash of three drops of silver nitrate in a tumbler of water will improve an unfavorable saliva.—*K. K. Cross, Dental Digest.*

Taking a Bite for a Bridge

In taking a bite for a bridge, cut a strip of stiff paper and lay between two strips of modelling compound; it is strong and will not break.

—*Gordon C. Barkley, Commonwealth Dental Review.*

Plate Polishing

Metal plates will take on a very high luster when a little aqua ammonia is used in mixing the chalk, instead of water. Vulcanite will take on a mirror polish if the finishing is done by the use of tin oxid made into a paste with glycerin. In either case a clean buff should be chosen, and kept exclusively for this purpose.—*Dental Record.*

The Need of Occlusal Rests

In all forms of removable bridge work or partial dentures, where clasps are used, some form of occlusal rest is necessary as a means of providing against subsequent settlement of the case. If this precaution is not observed, complete loss of occlusion and usefulness will soon follow.—*Hart J. Goslee, Practical Hints.*

Vinegar for Softening Plaster of Paris

Vinegar, having the property of disintegrating plaster, may be employed in the laboratory for removing plaster from flasks, by immersing for a few seconds only; for removing casts from articulator by applying over bows only; cleaning impression trays, etc.

—*Lester N. Roubert, Chicago, Dental Facts.*

Impression for Saddle Bridge

A hole is cut in the most suitable part of the impression tray through which an instrument can be placed on the saddle, which will enable the operator to hold the saddle or the base of the bridge down, and overcome the elasticity of the gums as the plaster is setting. This overcomes the leverage often exerted on the supporting tooth, which has made one-end attachments seem impractical to many operators, and also insures the distribution of the mastication force along the ridge, where there are several attachments. Care should be taken to have the saddle rest tightly on the ridge, so that it will give considerable support to the bridge, and not put all the support on the teeth used as abutments.—*J. J. Moffitt, Dental Cosmos.*

Saliva Ejector Tubes

Always keep saliva ejector tubes in sterile solution in a glass jar and be sure to remove same from jar in sight of patient, for then there will be no question as to cleanliness.—*Dental Facts.*

To Inhibit Caries

Another question arises: Have we any material other than nitrate of silver which, when applied to carious surfaces, will inhibit its progress or, rather, sterilize the cavity? A fifty per cent. solution of thymol, in acetone, applied to a dentin surface which must be thoroughly dehydrated, will accomplish this purpose. We cover it with a thin hard-drying varnish protected by a double coating.

—*Herman Prinz, Dental Items of Interest.*

Welding Amalgam

Sometimes a small part of an amalgam restoration is broken off in spite of the care of the patient and care by the operator. Such damage may be permanently repaired without removing the entire restoration by the following method:

Make a mixture of amalgam in the usual manner, then squeeze out the surplus mercury, but do not throw it away, for it contains tin. Take this mercury and tin and burnish it on the surface that you wish to add to and then build out with the amalgam. The rubber dam is not needed, for this weld can be made in the presence of moisture.

—*F. W. F., Pacific Dental Gazette.*

NEW PUBLICATIONS

Everyday Mouth Hygiene. By Joseph Head, M.D., D.D.S., Dentist to the Jefferson Hospital, Philadelphia. 12mo of 67 pages with 39 illustrations. Philadelphia and London. W. B. Saunders Company, 1920. Cloth, $1.00 net.

This is a valuable little book. It shows by word and picture how thoroughly to clean the teeth and lessen or prevent dental decay and to keep the gums in a healthy condition.

In his preface the author says: "Decay is not a normal condition of the mouth. Cleanliness of the teeth and gums will absolutely prevent decay, and may sometimes cure it. Up to the present all methods of cleansing the mouth have been failures, as they have not thoroughly removed the mass of infection from between the teeth and the surface of the gums."

The use of the dental floss to thoroughly remove all debris between the teeth, and the manipulation of the tooth-brush to thoroughly clean exposed surfaces of the teeth are splendidly illustrated by halftone engravings.

The little book is particularly useful, as the author says, "to loving mothers and conscientious nurses, so that future generations will acquire the correct principles of mouth cleansing, and thus the terrible disease of mouth infection will be banished from the human race."

General and Dental Pathology with special reference to Etiology and Pathologic Anatomy. A treatise for Students and Practitioners. By Julio Endelman, M.S., D.D.S., Professor of Special Dental Pathology, College of Dentistry, University of Southern California, Editor of *The Pacific Dental Gazette*, member of National, State and other Societies, and A. F. Wagner, A.M., M.D., Professor of General Pathology College of Dentistry, University of Southern California. St. Louis; The C. V. Mosby Co., Pub., 1920. Price, net, $7.00.

The authors state that it has been their aim to treat this subject from the standpoint of gross and microscopic pathology, realizing that the needs of the dental student call for just that character of information. Assuming that the object in undertaking the study of pathology is to the effect that the information necessary to treat diseases upon a rational basis may be available, the clinical aspects of the maladies discussed throughout the text have been worked out on the basis of the structural changes induced in the tissues by various forms of irritation. The clinic and the laboratory have been made use of extensively in the collection of data and their arrangement in sequential order, and an effort has been made to include only tangible information excluding all statements of more or less speculative character.

Part I, pertaining to general pathology, covers two hundred and twelve pages of text. Subjects treated, Etiology of Diseases, Pathologic Processes, The Circulatory Changes, Inflammation, Progressive Tissue Changes, Tumors, The Pathology of Infectious Diseases, Malformations.

Part II, Dental Pathology covers three hundred and sixty-two pages of text, and the following subjects are considered: Enamel, Dentin, Cementum, Development of Teeth, Hypoplasia, Deformities of the Teeth, Abnormalities in number of Teeth, Hutchinson's Teeth and other Syphilitic Stigmata, Dental Caries, Hypercementosis, Abrasion and Erosion, the Saliva, Gums and Gingivæ, Calcareous Deposits, Subgingival Deposits, Diseases of the Peridental Membrane, Nonseptic Pericementitis, Septic Pericemental Inflammation and Acute and Chronic Dento-Alveolar Abscess, Pathologic Anatomy of Acute and Chronic Dento-Alveolar Abscess, Bone, Periostitis of the Jaw, Pyorrhea Alveolaris, The Dental Pulp and its Diseases, Cystic Odontomas, Mouth Infections in their relation to Systemic Disease, Diseases of Gingivæ, Gums, and Oral Mucous Membrane.

The book is illustrated with four hundred and forty engravings, three hundred and forty in the section on Dental Pathology are original and four colored plates.

It is a comprehensive work on this important subject, and well written by capable men—a book well worthy of recommendation.

Oral Anesthesia. Local Anesthesia in the Oral Cavity. Technic and Practical Application in the Different Branches of Dentistry. By Kurt H. Thoma, D.M.D., Assistant Professor of Oral Pathology, and member of Research Department Harvard University Dental School, Instructor in Dental Anatomy, Harvard University Medical School, member National, State, and Local Dental Societies and Interstate Association of Anesthetists. Fellow in the American Academy of Dental Science, Associate fellow of the American Medical Association. Second edition revised with seventy-nine illustrations. Boston; M. C. Cherry, Pub., 22 Seymour street, 1920. Price, net, $4.50.

The first edition of five thousand volumes having been exhausted in a comparatively short time, and the continuous demand for this book, made it necessary to issue a new edition. The author made use of this welcome opportunity to entirely re-write the work. The volume is opened with a description of the nature of pain and fear, the two emotions which are so closely related. The author maintains that it is not sufficient to control pain alone, but the successful anesthetist and surgeon should also promote a helpful and cooperative attitude in the patient. Some new substitutes for cocain have received consideration in the chapter dealing with drugs, and the name "Procaine" has been substituted for "novocain" in the entire volume, as the latter is now manufactured in the United States and licensed by the Federal Trade Commission under this new trade name. The chapter on Ill Effects, Failures, Accidents, and Post-operative Sequelæ has been entirely changed, says the author, for more careful consideration, experience, and research work have done a great deal towards better understanding of these conditions.

In the last chapter, on Practical Application, the subject has been greatly condensed, leaving out material not strictly pertaining to local anesthesia.

The extra oral methods, of great value in war surgery, and extensive oral operations in general, have been described carefully and many new illustrations added to make the text more comprehensive.

A list of literature on local anesthesia and subjects correlated, has been added to give due credit to other writers and operators who have aided in the development of local anesthesia, as research workers or teachers.

Anesthesia in Dental Surgery. By Thomas D. Luke, M.D., F.R.C.S., Ed. Surgeon Lieut.-Commander, R. N. Hospital, Peebles; formerly lecturer on Anesthetics, Edinburgh University, Anesthetist to the Dental Hospital, etc., and J. Stuart Ross, M. B., F.R.C.S., Ed. Late Captain, R.A.M.C., (T.C.) Dental Hospital Instructor in Anesthetics, etc. Fourth edition, illustrated. St. Louis; C. V. Mosby Co., Pub., 1920. Price, net, $2.50.

In this book the authors have endeavored to give the dentists a working knowledge of anesthetics that he may apply in his every-day practice.

The first chapter is devoted to the History of Anesthesia and those following are devoted to the Choice of an Anesthetic, Nitrous Oxid Ethyl Chlorid, Ether, Chloroform and objections to its use, Sequences and Combinations, the Use of Local Anesthesia, the Accidents of Anesthesia, the L. D. S., Diploma and the Administration of Anesthetics.

The book contains two hundred and thirty-nine pages of text and twenty-two illustrations. It is concisely written and contains the essentials that every dentist should know before attempting anesthesia.

The Nose, Paranasal Sinuses, Nasolacrimal Passage-ways, and Olfactory Organ in Man. A Genetic, Developmental, and Anatomico-Physiological Consideration. By J. Parsons Schaeffer, A.M., M.D., Ph.D., Professor of Anatomy, Jefferson Medical College, Philadelphia; Formerly Assistant Professor of Anatomy, Cornell University Medical College, and Professor of Anatomy, Yale University Medical School. Philadelphia; P. Blakiston's Son & Co., Pub., 1920. Price, net, $10.00.

The author states that, "the object of this monograph is to present a study of the embryology, development and anatomy, both microscopic and macroscopic, of the human nose, the paranasal sinuses, the olfactory organ and certain other auxiliary structures.

The aim has been to present a more or less comprehensive account of personal studies and observations on the genesis, development, and anatomy of the nose and its related parts rather than compile a fairly voluminous literature with its not infrequent diverse conclusions. In large measure, therefore, the descriptions and discussions as set forth in the chapters are based upon researches by the author, extending over a period of years. Likewise most of the illustrations are based upon preparations, reconstructions, and dissections by the author and reproduced either by him or under his direction."

Chapter I, treats General Embryology and Development; Chapter II, the Definitive Nose; Chapter III, the Maxillary Sinus; Chapter IV, the Frontal Sinus; Chapter V, the Sphenoidal Sinus; Chapter VI, the Ethmoidal Cells; Chapter VII, the Nasolacrimal Passageways; Chapter VIII, the Nasal Mucous Membrane; Chapter IX, the Blood, and Lymph-vascular Systems of the Nose and the Paranasal Sinuses; Chapter X, the Common Sensory and the Sympathetic Nerves of the Nose and Paranasal Sinuses; Chapter XI, the Olfactory Apparatus Proper; Chapter XII, Physiological Addenda.

The subject is one that should concern every dentist and the study of such a book would be of great value to the practitioner. There are three hundred and fifty-eight pages of the text, illuminated with two hundred and four engravings, eighteen of which are printed in color.

Periodontal Disease and its Treatment by Ionic Medication. By Ernest Sturridge, L.D.S., (Eng.) D.D.S., Fellow Royal Society Medicine, member British Dental Association, author of Dental Electro Therapeutics, The Science and Practice of Dental Surgery, etc., Philadelphia; Lea & Febiger Pub. Price, net, $1.75.

This book, which is based on conclusions reached after over thirty years of experience and study of the most difficult problem, says the author, is intended to emphasize the local aspect of periodontal disease and to demonstrate that much can be done in combating the disease, systematizing a definite method of treatment to the exclusion of conflicting opinions of many writers on vital points of the subject.

In adopting the view that periodontal disease is purely local in origin, the writer has gone to much pains to draw attention to the incipient stages of the disease and to point out that those who ignore or overlook the importance of this stage do injustice to their patients.

A strong protest has been entered against reckless wholesale extraction of teeth as the only means of curing the disease. Treatment by ionic medication which is advocated, is intended to cope with one etiological factor but stress is laid on the futility of depending upon it alone and the importance of dealing with many other factors which are specified.

The book contains 136 pp. of text, is well written, and contains many helpful suggestions.

OHIO STATE SOCIETY

Notice to Members: Copies of the revised Constitution and By-Laws of the Ohio State Dental Society have been sent the Secretary of each Component Society in number sufficient to supply each member with a copy. Ask your secretary for one.

F. R. CHAPMAN, *Secretary.*

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The Component Societies of the Ohio State Dental Society

(This list of Officers is compiled from information furnished by the Secretaries of the various Components; where incorrect it is due to lack of information relative to elections. Secretaries are requested to keep the list correct by notifying the secretary of the State Society or the Editor of THE DENTAL SUMMARY of the result of elections.)

22 BUTLER COUNTY DENTAL SOCIETY, meets 3d Friday. each month.—Pres., P. A. Krucker, Hamilton, V. Pres., E. E. Meisterhaus; Sec.-Treas., F. T. Craven, Hamilton.

10 CENTRAL OHIO DENTAL SOCIETY, meets 1st Wed., Feb., May and Oct.—Pres., F. P. Leonard, Bucyrus; V. Prests., J. Pfanstiel and R. C. Bratten; Rec. Sec., L. T. McKinney; Cor. Sec., C. S. Delashmutt, Bucyrus; Treas., F. C. McCaughy.

27 CINCINNATI DENTAL SOCIETY, meets 3d Friday. Pres., Wilson Foster, 22 W. 7th St.; V. Pres., Paul Cassidy; Rec. Sec., C. H. Stricker; Cor. Sec., D. A. Leahy, 904 Union Central Bldg.; Treas., J. D. Gordon

6 CLEVELAND DENTAL SOCIETY, meets 1st Monday, Pres., I. M. Saum; V. Pres., J. A. Loughry; Rec. Sec., S. F. M. Hirsch; Cor. Sec., F. M. Casto, 458 Rose Bldg.; Treas., E. D. Phillips.

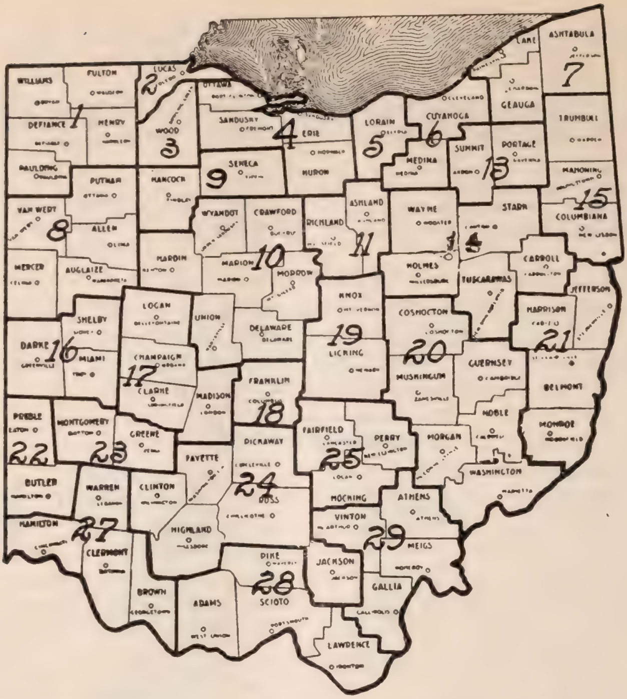
18 COLUMBUS DENTAL SOCIETY, meets last Tuesday, Pres., D. P. Snyder; V. Pres., F. L. Gruber; Rec. Sec., E. N. Hoopman; Cor. Sec., F. C. Starr; Treas., A. O. Ross.

15 CORYDON PALMER DENTAL SOCIETY, meets 2d Thursday, April and Oct.—Pres., J. F. Steele, Lisbon; V. Presidents, T. J. Evans, J. H. Chessrown and G. L. Moore; Rec. Sec., J. T. Williamson; Cor. Sec., W. B. Challis, Lisbon; Treas., J. K. Nash.

21 EASTERN OHIO DENTAL SOCIETY, meets 1st Thursday, May and October—Pres., C. S. Starkweather, Bellaire; First V. Pres, L. B. Peterson, Steubenville; Second V. Pres., George Sharp, Flushing; Cor. Sec., J. K. Hunter, Bridgeport; Rec. Sec., H. A. Smith, Steubenville; Treas., S. C. Hasbronck, Barnesville.

9 HANCOCK - SENECA COUNTIES DENTAL SOCIETY, meets 2d Wednesday.—Pres., A. C. Cole, Fostoria, V. Pres., ———; Rec. Sec., E. V. Burns, Findlay; Cor. Sec., A. E. Mann, Findlay; Treas., V. H, Michener.

25 HOCKING VALLEY DENTAL SOCIETY, meets 1st Monday.—Pres., J. J. Stukey; Vice Pres'ts., C.F.Acker; and W. M. Scott; Sec., R. H. Wetzel, Lancaster, Treas., J. A. Rockey.



5 **Lorain County Dental Society**, meets 1st Tuesday, Feb., Apr., Sep. and Nov. Pres., F. A. Newhall, Lorain; V. Pres., C. J. Love; Sec., J. G. Wherry, Elyria; Treas., J. E. Trombley.

17 **Mad River Valley Dental Society**, meets 2d Monday, bi-monthly.—Pres., E. Dibert, Springfield; Vice Presidents., A. E. Bible and H. Houser; Rec. Sec., H. H. Krapp; Cor. Sec. W. B. Seward; Treas., E. V. M. Thompson.

1 **Maumee Valley Dental Society**, meets 2d Tuesday, June and Oct.—Pres., N. A. Cunningham, Defiance; V. Pres., A. S. Blake; Rec. Sec., S. D. Potter; Cor. Sec., O. J. Wisman, Delta; Treas., J. A. Benner.

23 **Miami Valley Dental Society**, meets last Monday. Pres., H. C. Huffman; V. Pres., H. L. Oliver; Cor. Sec., H. M. Brewer; Rec. Sec., W. B. MacBain; Treas., J. R. Arthur; J. M. Chase; representative to the State Dental Society.

20 **The Muskingum Valley Dental Society** meets second Thursday, Jan., May and Sept.—Pres., P. F. Walker, Coshocton; V. Prests., A. W. Boyd and T. E. Axline; Sec., J. A. Honabarger, Warsaw; Treas., H. J. Boyd.

4 **North Central Ohio Dental Society**, meets 3d Wednesday, Jan. Apr., July and Oct.—Pres., A. G. Thatcher, Fremont; Pres. Elect., E. S. Braithwaite, Willard; Vice-Pres., H. S. Rogers, Sandusky; Rec. Sec., D. D. Smith; Cor. Sec. J. H. Billmeyer, Norwalk; Treas., L. F. Meyer.

7 **Northeastern Ohio Dental Society**, meets 2d Monday —Pres., H. O. Frederick, Ashtabula; V. Pres., O. T. Battles; Sec., R. J. Goggin, Ashtabula Harbor; Treas., R. J. Goggin.

8 **Northwestern Dental Society**, meets 4th Wednesday.—Pres., A. Jones, Lima; Vice Pres'ts., J. R Cannon and I. W. Wright; Sec. J. W. Dimond Lima; Treas., J. K. Bannister.

29 **Ohio Valley Dental Society**, meets 2d Wednesday, Apr and Oct —Pres. M. D. Hartinger, Pomeroy; V. Pres., R. B. Church; Sec., C. S. Shumaker, Pomeroy; Treas., J. B. Hodge, Middleport.

24 **Rehwinkel Dental Society**, meets 3d Thursday. Pres., A. M. Bush; V. Pres., O. A. Thompson; V. Pres., C. H. Martin; Sec., F. D. Wollard, Washington, C.H.; Treas., C. V. Laam.

11 **Richland-Ashland Counties Dental Society**, Meets last Monday. Feb., June and Oct.—Pres., B. W. Livingston, Ashland; V. Pres., J. H. West-Rec. Sec., I. R. Suter; Cor. Sec., J. F. Clark, Mansfield; Treas., E. F. Cleland.

28 **Southern Ohio Dental Society**, meets, 3d Monday. May and Oct.—Pres., W. H. Johnson, Waverly-V. Pres., A. S. Adams; Sec., C. E. Beatty, Portsmouth; Treas., E. O. Buchanan.

12 **Stark County Dental Society**, meets 3d Wednesday—Pres., C. O. Carr, Massillon; V. Pres'ts., B. H. Bowman and J. G. Foltz; Rec. Sec., C. A. Allensworth; Cor. Sec., F. M. Lose, Massillon; Treas., F. M. Lose.

13 **Summit County Dental Society**, meets 1st Friday. Pres., J. T. Connors, Akron; V. Pres.,———-Rec. Sec., H. G. Haas; Cor. Sec., F. S. Butler, 2d Nat. Bank Bldg., Akron; Treas., A. S. Butler.

2 **Toledo Dental Society**, meets 3d Friday. Pres., T. S. Shaw; V. Pres., H. W. Hisey; Sec., L. C. Jackson, 2205 Ashland Ave.. Treas., C. H. Cox.

30 **Tuscarawas County Dental Society** (a new society) meets 2d Tuesday. Pres. A. W. Davis, Dover; V. Pres., F. H. Waldron; Sec. and Treas., E. S. Wagner, Dover.

16 **Western Ohio Dental Society**, meets 1st Thursday, Feb., May and Oct.—Pres., A. A. Davis, Troy V. Prests,, P. G. Eddy, J. J. Little and V. E. Bedford; Sec'y-Treas., F. A. McCullough, Troy.

3 **Wood County Dental Society**, meets 2d Wednesday.—Pres., B. D. Roe. Bowling Green; V. Pres., R. E. Milbourn; Sec., T. M. Lea, Bowling Green; Treas., E. R. Beatty.

19 **W. D. Miller Dental Society**, meets 2d Thursday. May and Oct.—Pres., W. S. Deely. Mt.Vernon; V. Pres,, H. S. Barrick; Rec. Sec., L. E. Davis; Cor. Sec., E.V. Prior, Newark; Treas., W. B. Grossman.

SOCIETY·ANNOUNCEMENTS

Announcement

American Dental Library and Museum Association

The next annual meeting of the American Dental Library and Museum Association will be held, August 23, 1920, 3:30 P.M., at the Forsyth Dental Infirmary, Boston, Mass.

At that session the official business will be taken up and a permanent constitution adopted.

All societies, colleges, etc., applying before that time will be included as charter members.

Another session will be held later in the week to suit the convenience of the majority of members, when an interesting program pertaining to library and museum matters will be given.

Dr. Wm. Bebb will present a short paper dealing with methods of building libraries and museums and of conducting same.

Dr. L. Pierce Anthony, *Dental Cosmos*: Advisability of compiling a new dental bibliography, a standard reference list of books on dentistry published throughout the world. The last one compiled in this country was by C. G. Crowley, in 1885.

Dr. B. W. Weinberger: Bibliography of dental periodicals published in the United States and Great Britain.

All those interested are requested to be present.

A. F. ISHAM, *President,*
B. W. WEINBERGER, *Sec'y-Treas.,*
40 East 41st Street, N. Y. C

American Academy of Periodontology

The annual meeting of the American Academy of Periodontology will be held at the Copley-Plaza Hotel, Boston, Mass., August 26-27-28.

DR. B. F. MILLER, JR., *Secretary.*

Association Military Dental Surgeons

Association of Military Dental Surgeons will hold their annual meeting in Boston, Mass., August 24 and 25, 1920.

G. H. CASADAY, *Secy.-Treas.* ROBT. T. OLIVER, *President*
Presidio of San Francisco, California.

OBITUARY

Dr. Walter J. Hagedorn

was born at Cleveland, O., December 1, 1894, grew up in that city, where his pleasing personality made for him a host of friends, and died at Silver City, New Mexico, June 24, after a protracted illness.

He was graduated from Western Reserve University, class of 1916, and established himself in practice at Superior and 105th street, Cleveland.

He was Grand Master of Epsilon Chapter of the Psi Omega Fraternity.

Dr. Hagedorn was interested in industrial dentistry ever since his graduation and was employed in that capacity by various institutions in Cleveland. The past two years, however, he served as supervisor of the public school dental clinics, and under his charge the efficiency of the work increased fifty per cent. He seemed especially adapted to the work with the children, and expected to specialize in that line.

Dr. Hagedorn was an active worker in the Preparedness League of American Dentists.

Dr. Hagedorn married Miss Pauline R. Stumph, of Mt. Vernon, O., in the fall of 1916, whom he leaves a widow with one son, Walter John Hagedorn, Jr., who was born three years ago.

Let every man remember that to violate the law is to trample on the blood of his father, and to tear the charter of his own and his children's liberty. Let reverence for the laws be breathed by every American mother to the lisping babe that prattles on her lap; let it be taught in schools, in seminaries, and in colleges; let it be written in primers, spelling books and in almanacs; let it be preached from the pulpit, proclaimed in legislative halls, and enforced in courts of justice. And, in short, let it become the political religion of the nation, and let the old and the young, the rich and the poor, the grave and the gay of all sexes and tongues and colors and conditions sacrifice unceasingly upon its altars.—*Abraham Lincoln.*

NATIONAL DENTAL ASSOCIATION ANNOUNCEMENTS

Golf Tournament

The National Dental Golf Association was organized at New Orleans last October, and temporary officers elected.

The first tournament will be held in Boston on the Woodland Golf Course, Monday, August 23rd, 1920, during the meeting of the National Dental Association.

We propose to effect a permanent organization at that time. Officers will be elected, committees appointed, and suitable By-Laws adopted.

It is desired that all members of the National Dental Association, interested in golf, should become affiliated. An effort is being made to supply such persons with application blanks. There is an application blank at the end of Chick Evans' article on "Why professional men should play golf," published in the April issue of the *Journal of the National Dental Association.* A blank may also be secured from the Secretary-Treasurer.

You should join the Association whether you expect to attend the Boston meeting or not. The admission fee is paid but once, and no other fees will be charged except to those who participate in the tournaments.

The following events have been suggested for the Boston Meeting:

36-Hole Medal Play for Association Championship.
36-Hole Handicap Medal Play.
36-Hole Against Par.
36-Hole Handicap Against Par.
Best Ball Twosome for 36 Holes (Less ½ total Handicap).
Best Ball Foursome for 36 Holes.
18-Hole Handicap Medal Play (morning).
18-Hole Handicap Against Par (afternoon).
Low Net Medal Score for Best 9 Holes (morning).
Low Medal Score for Best 9 Holes (afternoon).

While it is the intention of the Association to conduct an annual tournament at the time and place of the National Dental Association Meeting, it is not proposed that it shall in any way interfere with the Scientific program.

Any further information will be gladly furnished upon request.

F. M. Casto, *Chairman,*
464 Rose Building
Cleveland, O.

Ralston I. Lewis, *Secy.-Treas.*
25 E. Washington St.,
Chicago, Ill.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

Well, boys, they're off! Between you and me and the gate-post the race looks to me like a mighty even one. Personally, I think both of the parties might have done a lot better, and indications are that many members of both agree with me. I have failed to note any exuberant degree of enthusiasm in either the Harding or Cox camps, and I'm in pretty close touch with both. I do believe that the nomination of Cox was the logical answer to the prior nomination of Harding. The two men seem very much on a parity personally and politically. Both are strong party men, partisans, both are office-holders, and have been for years, and they may be expected to employ old-line party methods in the conduct of their campaigns. Neither man stands out as pre-eminently *the* man to take hold of our muddled affairs and lead the American people into paths of righteous living and progressive peace.

There is now an Australian Edition of THE DENTAL SUMMARY, issued by cooperation between our publishers and the Dental Association of New South Wales, Sydney. After almost unbelievable difficulties, the first number appeared in June and is to be issued regularly hereafter, unless the Fates in the person of officialdom in that far-off country interfere to prevent. Some of these days I hope to write a full account of the whole matter, as a warning to those in our own country who seem to demand that Government have its finger in every private business enterprise. For instance: The legislature just previous to the present one established a rate of duty under which the half-tone illustrations that are sent from the Toledo office would have paid about $100 tariff. After the first shipment reached port of entry, and before it could be taken out of bond, the then-sitting parliament increased this duty to more than $200—£27 and £54, respectively, seeming determined to make the duty positively prohibitive. However, there is an end to all things mundane, and we hope that *The Australian Dental Summary*, under the energetic and resourceful management of the officers of the dental association, may have a long life and a useful one.

Picnics, vacations, rest-spells, fill the air. I hope every one of you has enjoyed, is enjoying, or expects still to enjoy the very best summer in his life. I take mine by jumps and jerks, but it is none the less welcome on that account. During a summer like this, vacations seem hardly necessary, and surely nothing can be so interesting as work.

Two magnificent gifts, one by Mr. George Eastman of $4,000,000 and the other of $5,000,000 from Mr. John D. Rockefeller, recently made to the University of Rochester, opens up splendid visions of unrivalled schools of medicine, dentistry and chemistry to be established at that New York city. With such an endowment, almost anything may be accomplished, and I shall look with great interest to the completion of plans that are now only in the making.

The new republic of Poland says that its requirements of artificial teeth from America during the next twelve months will total upward of 2,000,000.

Practicing dentistry without a license is getting to be an expensive pastime over in New York. One of the illegal brood was sentenced the other day to pay a fine of $250 and spend sixty days of his vacation in the Brooklyn county jail. This should help some to curb the evil, provided the jail part of the sentence be not suspended or something like that.

Fifty-one students were graduated from the New York College of Dentistry, June 16.

It is estimated that dentists use a million ounces of platinum annually—more than twice as much as is used in the manufacture of jewelry.

Harvard University has been the recipient of over $8,000,000 during the past year, in sums above $50,000 each. In all, probably another million.

Dr. R. L. Rogers, Amarillo, is president of the Texas state board of examiners.

Attorney-General Thompson, of the State of Washington, has rendered an opinion that may and should have wide-spread results, in that school authorities have the right to compel pupils to undergo dental, medical and physical examination at the hands of inspectors appointed by them under pain of suspension or expulsion in case of refusal. Vaccination, however, is not compulsory. If laws do not exist in other states under which similar rulings may be made, it is the business of the legislative committees of the various dental and medical societies to see that they are introduced and passed.

Dean Arthur D. Black, of the Northwestern, declares that there are 4,200,000 cavities in the teeth of the 570,000 Chicago school children. He proposes a new dental school on the proposed Chicago campus site, and a free clinic, with one hundred chairs, capable of taking care of a hundred thousand children a year, which indicates that Dr. Black is some little old dreamer himself, and probably knows how to make his dreams come true.

Dr. Adam Gantz, of Ligonier, Ind., has been in continuous practice for sixty years. His friends are claiming for him the title as "Oldest practicing dentist." How about it? Does anybody dispute the claim?

Huntington, Ind., will have a school clinic ready for operation by the opening of the fall term. The city dentists are to donate services.

Our good friend Dr. George L. Powers, of Paris, has been chosen president of the Tennessee state board. Associated with him on the board are Drs. J. A. Gholson, Clarksville, and F. W. Meacham, Chattanooga.

Twenty-six graduates were set adrift on the stormy sea of dentistry by the Baltimore College, June 15.

Dr. Carl A Thorpe, 29, of Grove City, Ohio, has entered the dental corps of the regular army, and has been assigned to the Mexican border.

Miss Geraldine M. L. Courtright, daughter of Dr. G. S. Courtright, New Lexington, Ohio, was the only girl graduate in the class at the Ohio College, Cincinnati, and was immediately appointed dental interne in the Cincinnati General Hospital, the first of her sex to be accorded this honor.

In a recent issue of THE SUMMARY, the statement was made that the Government was prepared to give courses in dentistry to enlisted men. That statement was based upon erroneous information. The courses given are preliminary only, and fit the recipients for work as assistants in the dental corps. A little thought should have prevented my error. I know well that the army is not prepared to take the place of the college. Vocational instruction, fitting the enlisted man for many kinds of work, is given in many fields; but professional education cannot be completed in the army; only the preliminaries can be had there.

The National Association, meeting in Boston this month, is to be asked by Massachusetts dentists to take action to the end that the Volstead enforcement act may be amended insofar as it discriminates against the dentist and in favor of the medical man. Dentists are allowed but six quarts per year, while M.D.'s may keep and dispense any quantity in emergency; dentists are required to use their allowance for sterilizing purposes only, while no such limitations apply to physicians and surgeons.

Now that such things are permanently on our national black list, it has been discovered that champagne is the best and most effective dentifrice for the neutralization of sugar hydrates in diet. Wouldn't it be a joke on the Volstead act if champagne were let in duty-free as a tooth-wash? Stranger things have happened.

The husband of a patient has been awarded $9,000 compensation for the loss of his wife through the alleged carelessness of a dentist in that he used an uninsulated electrical engine for driving a bur during an electrical storm! It is claimed, and the claim allowed, that the uninsulated wires leading to the instrument carried a heavy charge into the mouth of the patient, causing severe burns, resulting in tetanus and death. It does not seem possible that such a verdict can stand the test of the higher courts if carried up. Of course, the dentist may have been careless, may have been guilty of traumatic lesion, and may have been responsible indirectly for the death of the patient; but I have yet to be convinced that electricity, carried into the mouth, through the handpiece, could have had anything to do with it. But the warning is there, just the same. Be careful to convince your patients that you have taken every precaution to protect them against the destructive influence of thunderstorms!

The verdict in the more or less notorious Williams vs. Bauman case, under which the plaintiff was given a verdict for $25,000 on account of the death of her husband as the alleged result of improper dental treatment, was set aside and revoked by Supreme Court Justice Young, on July 12, upon retraction of certain testimony given by other dentists during the trial as to the injurious effects of certain medicines employed by Dr. Bauman. The verdict was summarily "vacated, set aside, cancelled and annulled, in all respects the same as though it never had been entered"—and there's an end of that.

Dr. M. M. Dexter, Centertown, Ky., has been appointed examiner for Ohio County, in the U. S. Public Health Service.

Idaho courts have decided that dental licenses cannot be revoked on account of advertising in newspapers or otherwise.

Ohio—Rehwinkel

Washington, C. H., June 9.—The annual session of the Rehwinkel Dental Society was attended by representatives from Wilmington, Hillsboro, Columbus, Chillicothe, New Holland, Leesburg and Dayton, numbering more than forty in attendance.

In the election of officers that preceded the business session Dr. Thompson, of Hillsboro, was chosen president of the Rehwinkel Dental Society; Dr. Kaye, of Chillicothe, secretary; C. V. Yaple, of Chillicothe, treasurer; C. N. Martin, of Wilmington, first vice-president; C. W. Sodders, of this city, as second vice-president; T. M. McFadden, censor. These men will serve one year. Outgoing officers are: A. M. Bush, president; F. E. Woolard, secretary, and C. V. Lanum, treasurer.

Michigan—Upper Peninsula

Marquette, June 19.—D. C. B. Kitchin, of Escanaba, was elected president of the Upper Peninsula Dental Association this week to succeed B. W. Boyer, of this city, who held the office during the past year. The dentists held their annual meeting in Escanaba, the election of officers following a dinner at the golf club. Menominee was chosen as the meeting place for 1921. At the business session Dr. Boyer gave an interesting address outlining the work done during the last year by the association and its plans for the future.

Virginia—State

Lynchburg, Va., July 3.—The fifty-first annual convention of the Virginia Dental Association came to an end here last night, following a banquet. Officers elected are: President, M. B. Rudd, Richmond; vice-president, W. M. Sturgis, Marshall; treasurer, W. N.

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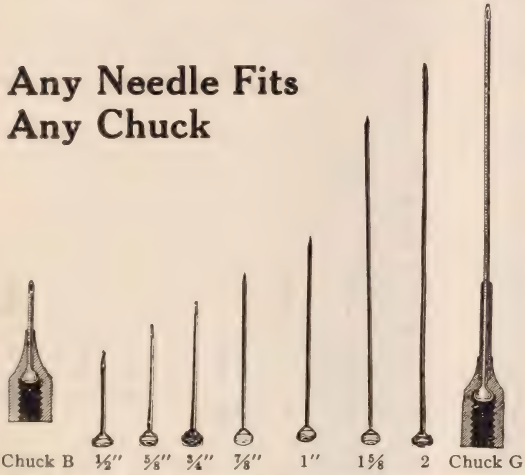

LENGTH OF NEEDLE:	½	⅝	¾	⅞	1	1⅝	2
POINT EXTENSION: When used with Chuck B..... (Covers Needle ⅜″)	⅛	¼	⅜	½	⅝	1¼	1⅝
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Hodgkin, Warrenton; secretary, Harry Bear, Richmond, (re-elected); executive committee: W. G. Delp, Rural Retreat; W. E. Witt, Abingdon; F. R. Tolley, Petersburg.

Illinois—Peoria County

Peoria, June 9.—The Peoria County Dental Society held its last meeting and banquet of the year Monday night. Officers for the following year were elected as follows: J. C. Murdock, Peoria, president; C. M. Atkinson, Havana, vice-president; H. F. Barclay, Peoria, secretary; C. N. Newlin, Peoria, treasurer, and C. C. Smith, Peoria, librarian. Following the election of officers the annual address of the retiring president, C. B. Brownell, Peoria, was read.

Minnesota—Southern District

Mankato, June 10.—A. R. Schmid, of Worthington, was chosen president of the Southern Minnesota District Dental Society, at the closing session of a three-day convention in this city yesterday. G. J. Gish of Le Sueur was chosen vice-president; W. G. Norris, Track, secretary; C. P. Peterson, of Mankato, treasurer, and M. R. Coulter, of Mankato, a member of the state executive board.

Idaho—State

Pocatello, July 1.—At a business meeting of the Idaho State Dental Association, held last evening the following were elected officers for the ensuing year: L. G. Phillips, of Jerome, president; A. W. Cate, of Boise, vice president; and M. J. Goode, of Filer, secretary; C. B. Over, of Boise, J. J. Bybee, of Idaho Falls and A. M. Jacobsen, of Pocatello were chosen as members of the executive committee. The following were appointed board of censors: Mazie Halterman, of Malad, R. A. Sutcliff, of Idaho Falls and H. B. Culver, of Boise. H. C. Coleman, of Buhl was elected a delegate and R. J. Cruse, of Pocatello an alternate to the National Dental Association convention Boston.

Louisiana—State

New Orleans, June 17.—Wednesday was the last day of the State Dental convention, and by far the most important one in the three days of the meeting.

O.J. Ory, was elected president. The banquet, which ended the convention, took place in the gold room of the Grunewald Hotel, at eight o'clock Wednesday night. During the banquet, J. Crimen Zeidler was presented with a gold cigarette case and holder by the society in appreciation of his work as chairman.

Oregon—XI Psi Phi

Portland, June 16.—At a recent meeting of the Xi Psi Phi, at the North Pacific college, the following officers were elected: R. J. Howell, of Butte, Mont., president; D. Devero, of St. Helens, vice-president; L. Swearing, of Seattle, secretary; H. Rogers, of British Columbia, treasurer; C. M. Wheeler, of Portland, scribe; W. Callahan, of Butte, master of ceremonies; L. G. Rice, Portland, monitor.

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Colorado—State

Colorado Springs, June 18.—A. G. Kelley, of Denver was chosen president of the Colorado State Dental Association in convention here; W. A. DeBerry, of Colorado Springs was elected vice-president; H. W. Wilson and William Smedley, both of Denver, were re-elected secretary and treasurer of the association respectively.

The members of the association who were named as nominees to be appointed by Governor Shoup to the state board of dental examiners were L. W. Spencer, of Pueblo, F. P. Wells, of Colorado Springs and William Flint, of Denver.

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Per ounce, liquid	$1.00
Six ounces	5.00
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Arkansas—Southeastern

Pine Bluff, June 21.—The Southeastern Arkansas Dental Association convened here today with about twenty-five visitors attending. The meeting was called to order by L. B. Sims, of Eudora. After the transaction of the usual routine business the annual election of officers was held, which resulted as follows: President, E. L. Lindsey, of Portland; vice-president, J. C. O'Daniel, of Pine Bluff; secretary and treasurer, E. A. Payne, of McGehee; corresponding secretary, E. B. Evans, of Holly Grove.

New Mexico—State

Albuquerque, June 25.—The New Mexico Dental Society closed its three-day session with what was said to be the most successful meeting of its history. The morning session was taken up with the clinical work.

At the business session held in the afternoon the following officers were elected:

President, C. F. Helmig, of Raton; first vice-president, C. H. Woolgar, of Magdalena; second vice-president, C. W. Hoover, of Dawson; secretary-treasurer, M. R. Chapin, of Las Vegas.

Utah—State

Salt Lake City, June 24.—W. A. Squires, of Salt Lake, was elected president of the Utah State Dental Society for the year 1920-21, at the meeting held Tuesday night. Other officers elected were as follows: D. D. Stockman, Salt Lake, re-elected first vice-president; I. P. Stewart, Logan, second vice-president; F. W. Meakin, Salt Lake, re-elected secretary-treasurer and general manager.

Tuesday morning a lecture was given by D. D. Campbell, of Kansas City. Arthur E. Smith, of Chicago, lectured this morning on "Nerve Blocking." F. E. Roach, of Chicago, will lecture tomorrow on "Removable Bridgework."

Dr. Furnas Joins W. R. Staff

I. Lester Furnas, who has been a lecturer in prosthetic dentistry at the Indiana Dental College, in Indianapolis for ten years, has accepted a similar position with the Western Reserve University, Cleveland.

For the last several years, he has been conducting post-graduate courses at Indianapolis and at the University of Minnesota. He is a member of the National Dental Association and the Indiana Dental Society, and is president of the Indianapolis Dental Society.

Perhaps when we get him over into Ohio we can induce him to complete that series of articles he has been writing for THE SUMMARY since Hector was a pup. Here's Hopin'.

"How do you like that cigar I gave you, old man? For two hundred bands off that brand they give you a gramophone."

"You don't say! If I smoked two hundred of those cigars I wouldn't want a gramophone; I'd want a harp."

DEATHS

At Flemington, N. J., June 24, Dr. Leo C. Wilson, aged 75.

At Chelsea, Mass., June 24, Dr. Elmer L. White, aged about 60.

At Minneapolis, June 14, Dr. Charles Monroe Bailey, aged 77. He was the oldest dentist in Minnesota, having practiced for forty-six years.

At Bloomington, Ill., June 8, Dr. Thomas H. Smith, a pioneer dentist.

At Dayton, Ohio, June 22, Dr. B. F. Adams, aged 64.

At Chicago, June 30, Dr. Allison B. Travett, aged 28. Family trouble caused his suicide by the gas route.

At Keyport, N. J., June 30, Dr. Richard W. Jewett, aged 51. Suicide by severing arteries.

At Carlisle, Ky., June 22, Dr. T. E. Hutchings, aged 47.

At Philadelphia, June 30, Dr. Simon V. Santz, aged 57.

At Plainfield, N. J., July 12, Dr. Charles R. Thiers, aged 71.

At Philadelphia, June 10, Dr. William H. Gwinnutt, aged 42.

At South Boston, Mass., July 14, Dr. William P. Hurley, aged 33.

At Chicago, July 13, Dr. James Perry Smith, founder of the free dental clinic at Chicago stockyards, and active in clinic work.

Again Honored

On June 29 the announcement was made that at a meeting of the state dental board in Columbus, Dr. A. F. Linscott, of Marion was re-elected president, and Dr. Robert H. Vollmayer, of Toledo was re-elected secretary.

Why not make it for life? The board couldn't do better.

From the lay press it is learned that some of the school clinics are likely to close for want of patronage for the most part. In these days of lavish money prosperity, it seems that hardly anybody wants anything for nothing. That should be easy. If they simply must pay, let 'em pay. If nobody wants the money, there should be plenty of places in which it could be used for public betterment.

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National Anesthesia Research Society

The officers of the National Anesthesia Research Society have been advised of several research workers who will present the results of their experiments and observations at the annual meeting of the society, at Hotel William Penn, Pittsburgh, October 4-8. Prizes aggregating $200 have been offered for the best research papers submitted.

Within thirty days after the challenge of Indianapolis, Toledo replied with one hundred per cent. enrollment of its recognized anesthetists, as members of the National Anesthesia Research Society. The society, only six months old, already has a membership closely approximating much older institutions, and is already represented in twenty-six states and Canada.

A correspondent of the N. A. R. S., writing of the conference of anesthetists held in con-

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Contains no acid.
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Saves tooth tissue.
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SURESEAL adheres tenaciously to enamel margins and forms a moisture-proof joint, but *does not* stick to carrying instrument and pull away from tooth. Can be worked to all margins without drawing.

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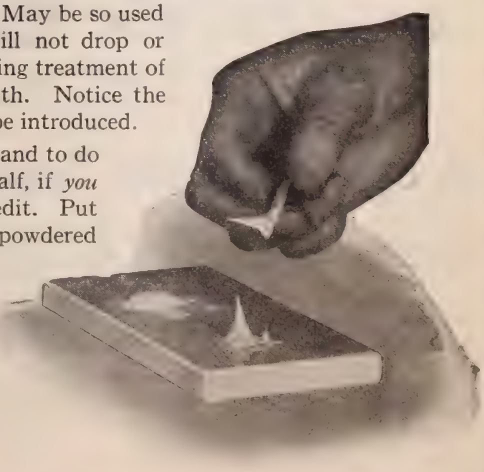

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nection with the fifth annual convention of the Catholic Hospital Association, at St. Paul, says it was decided that ether with nitrous oxid oxygen is the safest anesthetic. Chloroform was in disfavor because of the large number of casualties from asphyxia said to result from its use.

The N. A. R. S. has been advised that fourteen county societies in California have adopted resolutions within the last few months reading "That we favor the limitation of the administration of anesthetics to regularly-licensed physicians and surgeons."

In connection with this county movement the N. A. R. S. is advised that the House of Delegates of the California State Medical Association, meeting at Santa Barbara, took formal action:

1. That the administration of an anesthetic is always the function of a legally-qualified medical practitioner.

2. That the administration is best performed by physicians specially trained or who have made a specialty of this subject.

3. That wherever available, hospitals and public institutions, where anesthetics are administered, employ only physicians as anesthetists.

4. That this society condemns, under all circumstances, the training and qualification of lay persons as anesthetists.

5. That no hospital shall be deemed to have acceptable standings which charges a fee for an anesthetic unless such anesthetic has been administered by a legally-qualified physician.

Will the N. A. R. S. kindly inform SUMMARY readers whether or not it favors the exclusion of dentists from those "legally qualified" to administer anesthetics?

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THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL September 1920 No. 9

PHYSIOLOGICAL FACTORS IN THE RETENTION OF ARTIFICIAL DENTURES*

BY DAYTON DUNBAR CAMPBELL, D.D.S., KANSAS CITY, MISSOURI

SPECIAL LECTURER DENTAL PROSTHESIS, KANSAS CITY WESTERN DENTAL COLLEGE
FOUNDER AND PRESIDENT OF CAMPBELL SCHOOL OF PROSTHETIC TECHNIC

CHANGING PHYSIOLOGICAL CONDITIONS often have rendered useless the most accurately constructed and most splendidly adapted artificial dentures. Satisfaction in the wearing of dentures may be interrupted temporarily through a lowering of the general tone of the system induced by weariness, strain or ill health. It is a fact of common experience that muscles are more relaxed during the afternoon or late evening hours, a person is "on nerves," and tissues are more or less exhausted. Shoes that may be worn with comfort during the morning hours are unendurable in the afternoon, artificial limbs are a source of irritation as the day draws to a close, and even an artificial eye may be laid upon the shelf. Accordingly, when local indications fail to suggest the source of occasional imperfect adaptation, the prosthetist will wisely make inquiry regarding the patient's health.

The younger the patient the more satisfactory the condition of the tissues; with age comes diminution of vigor, reduced tension and a general relaxation throughout the system. Whether young or old, a patient in good health may be more easily provided with satisfactory dentures than is possible when a patient is in ill health, while to the prosthetist a convalescent is physiologically more acceptable than an individual in declining health.

Physiological factors of genuine importance in the retention of artificial dentures are the general state of health, the muscles of the mouth, the saliva, the condition of the mucous and submucous tissues, together with the condition of the alveolar process underlying them. The muscles of the mouth and their attachments give the prosthetist the least concern in his effort to secure the best retention for the denture, since only one of these, the buccinator muscle, is likely to offer any interference to his designs. With reference to these it is only necessary to see that the denture does not impinge unduly upon either muscles or attachments.

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*This is the eighth of a series of twelve articles being written by Dr. Campbell, especially for THE DENTAL SUMMARY.

*EDITOR'S NOTE: Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

When the patient presents, an examination of the mouth will immediately disclose physiological conditions which will directly determine the operator's procedure in taking the impression and in the construction of the denture. Conditions which physiologically place a patient in Class A-1 so far as the wearing of dentures is concerned, will be a good-toned tissue underlaid by processes in good condition. This tissue will be characterized by a varying degree in thickness, but sufficiently liberal in this respect to afford a covering of mucous and submucous tissues for the underlying bony structure. This will indicate through its color a desirable quality and quantity of blood supply, which, together with a firmness suggesting stability and relative immobility, will assure a physico-physiological base upon which the mechanical masticatory substitute, may confidently be placed, since tissue of this kind furnishes a highly desirable anchorage.

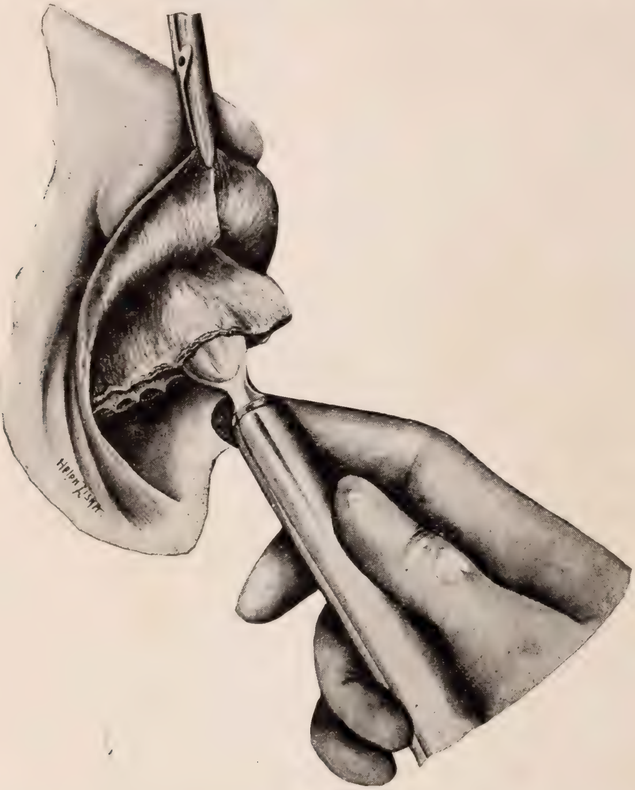

Fig. 1— This illustration shows the case with teeth extracted, and the mucoperiosteum being stripped back.

Modifications of the *most desirable* tissue are found in cases in which the spinous processes of the alveolar ridge have not been resorbed and are found in a chronic pathological condition. The tissues overlying these spicules will continue in this state for many months or even years unless the surgeon excises them. In some instances the presence of these spicules may not be accompanied by any pathological condition but the compression of the tissues over these points causes uneasiness to the wearer and reduces efficiency. A symptom of this condition is the appearance of a colorless spot on the tissue. This spot is characteristically different in appearance from a somewhat similar source of irritation which is ascribed directly to a trauma produced by an elongated cusp or a malocclusion of the dentures. Instances may be cited in which one of these points of irritation through a period of years has been the sole source of discomfort and consequent dissatisfaction with otherwise splendidly adapted dentures. At the time the natural teeth were removed this could have been avoided through a removal of the infectious process adjacent to the apical involvement. In failing to remove this part of the process there was allowed to remain a low grade pathological condition, which is in reality a chronic infectious osteomyelitis. In an individual of strong vitality and in vigorous health the blood stream is capable, through its own corrective processes, of promoting such regeneration of tissues as will finally eliminate this source of infection.

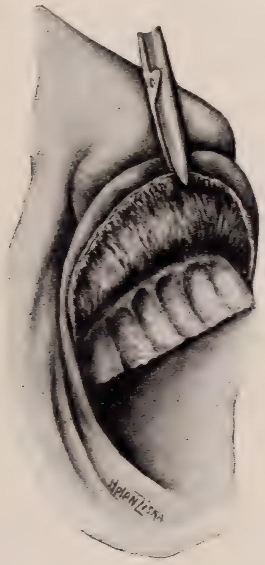

Fig. 2

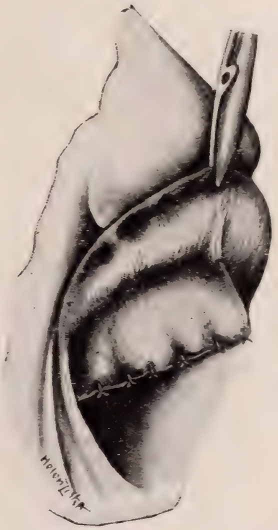

Fig. 3

Fig. 2—Condition after removal of the buccal and labial plates and after curettement of the diseased alveoli.
Fig. 3—Operation completed.

The writer's attention was first directed to this chronic infectious process by Dr. Wm. Colburn, of San Francisco, but its significance was vividly impressed upon the writer through seeing Dr. W. L. Shearer, of Omaha, perform an operation. The patient presented with an edentulous mouth that gave no local evidence of any underlying pathological condition. The writer, unacquainted with the history of the case, certainly *never* would have recommended an operation, but would have proceeded to construct dentures for the patient. However, the teeth had been extracted some months before in order to remove sources of infection whose presence the radiographs indicated, and which subsequent clinical *observation* demonstrated. With all other apparent or possible sources of infection eliminated, the debilitated condition of the patient continued.

Since it was known that the teeth were "pulled" instead of being surgically removed, and that under such circumstances the chronic encapsulated abscesses at the apices of the teeth usually are severed and remain undisturbed, the conclusion justified the operation which the writer witnessed.

A continuous incision was made in the upper arch from tuberosity to tuberosity, the muco-periosteum liberally stripped back and the buccal and labial plates removed, exposing the alveoli their full length along these borders. In five of these alveoli the granulomas remained intact in the same position and no doubt in the same condition as before the teeth were removed. On account of the method of making a liberal excision and removing the plates, these granulomas were removed as easily and completely as peas are removed from the pod, thus avoiding any technic of curettement that would push the contents of these sacs into the bony structure. The necrotic recesses in which these sacs are found were removed by curetting. It is this chronic pathological alveolar process which nature often fails to eliminate through resorption and which, because of its mild deleterious effect and its reduced activity, the system is not prompted to dispose of as a sequestrum.

Through the courtesy of Dr. Shearer we are enabled to give in the accompanying figures a clearer presentation of the case mentioned above. Dr. Shearer tells us that he designed this operation in 1905, and has employed it without important modifications up to the present time.

Dr. Shearer's article describing this case appeared in the June issue of the *National Dental Journal.*

While, as we have observed previously, the spinous processes may not necessarily be accompanied by any pathological condition, because of their spine-like character, they tend, under stress of mastication, to press through the overlying tissues, and the patient, through fear of pain, unconsciously avoids putting any real stress upon the bolus of food. Therefore, when a case presents in which ample time has elapsed for the resorption of these points and they still remain, they should be surgically removed.

Contrasted with the condition of tissue mentioned in the case with alveolar infection, is the following case which is familiar to every dentist: The patient has but six or eight lower anterior teeth, wears a full upper artificial denture and attempts to masticate upon these anteriors. The force of mastication has been centered upon the anterior portion of the ridge, with the result that this pressure has caused a resorption of the alveolar process in the upper ridge corresponding to the width of these lower teeth, but there remains an unusually heavy layer of unusually mobile and compressible tissue over this resorbed process. In the process of mastication the upper denture has come to make very noticeable excursions in keeping with the excursions of this movable tissue upon which the base of the denture rests. During the resorption of this section of the process the patient has found mastication an increasingly unsatisfactory task, while the changing occlusion, perhaps accompanied by disease, has affected the few natural lower teeth, and as a last resort another appointment is arranged with the dentist.

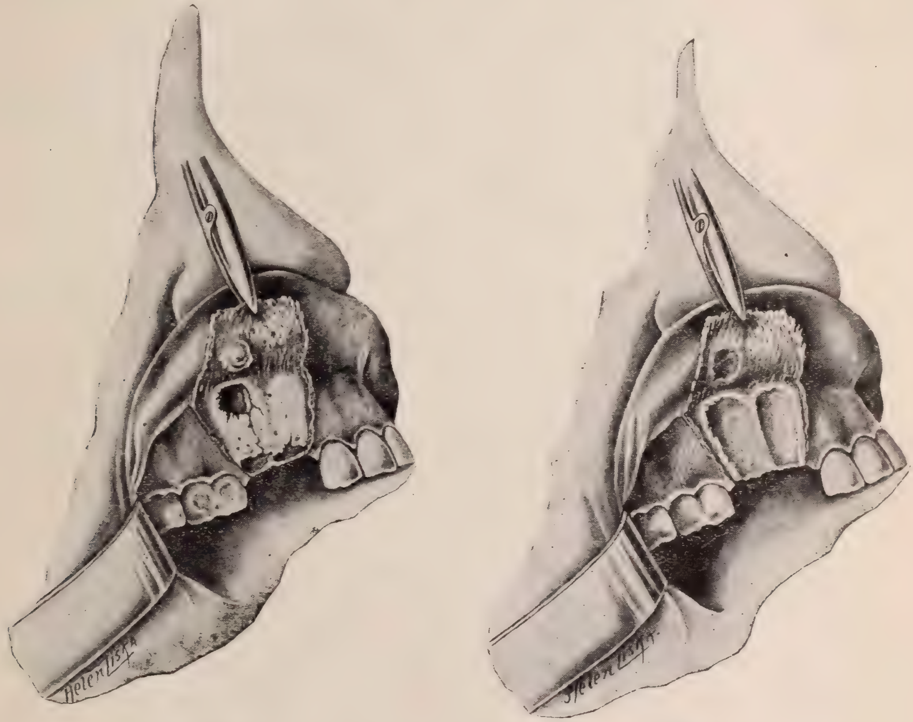

Fig. 4 Fig. 5

Figs. 4 and 5—These figures show the condition of the alveoli before and after a modified alveolectomy. In the case presented above, this condition characterized five distinct areas.

Methods of different types have been suggested and practiced by different operators in compressing this tissue, in making provision for it beneath the denture, and in other ways favoring it during impression taking, but the method which recommends itself most strongly to the writer and which he recommends as the most logical and most generally satisfactory one in dealing with excessive tissue of this kind, is to remove the superfluous portion entirely. The operation is a very simple one. The tissue needs only to be infiltrated with an anesthetic when, with a small pair of curved-beak crown shears, it may be cut away in a continuous strip, beginning in the region of the second bicuspid and ending in a similar region on the other side. It may be well to suggest that these shears are employed because of their superior cutting leverage, and that shears tend to compress the ends of the blood vessels, thus lessening the flow of blood. The operator should press the shears hard against the process as if a portion of this were to be excised. The outline of this tissue to be cut away should be noted before infiltration, since when anesthetized it presents a firm appearance and the prosthetist may then be reluctant to cut it away sufficiently.

After the operation, the denture in this region should be filled with orthoform paste and the patient allowed to wear it out of the office and until the wound is healed, when, at the end usually of three or four weeks, the new denture may be constructed. Any attempt to preserve any of the tissues to assist in covering the denuded area is superfluous since the old denture will serve the desired purpose. When the healing period has elapsed the denuded area will have been supplied with new tissue so that the case will be physiologically one of splendid possibilities for the prosthetist.

Often in a mandible, otherwise favorable, a condition is found in which, at the summit of the ridge and along its entire length, the tissue structure presents a loose portion about four mm. in height and of about the same breadth. This may be removed after the method just suggested for excising the superfluous tissue of the upper.

The saliva must be regarded as an important physiological factor as well as a physical factor. Patients often present with saliva the viscosity of which is such that in using the cuspidor they find it necessary to detach the saliva from their mouths in strings. If the patient is instructed to wash out the mouth with a diluted solution of muriatic acid, or with some of the proprietary mouth washes containing zinc chloride or some other astringent agent, the salivary glands are immediately excited to action and the mouth is thus readily emptied of this objectionable mucous and is then ready for the taking of the impression.

The most difficult physiological condition with which the prosthetist must contend is perhaps that in which the mouth is scantily covered with unyielding tissue overlying a hard structure not only in the vault but also on the ridges. This condition is characteristic of those cases in which attempted mastication has been carried on for years without the aid of dentures, and results from Nature's effort to assist. The hard tense character of these tissues and structure makes it impossible to imbed the base of the denture. Consequently the prosthetist's effort to avail himself of these tissues to prevent ingress of air beneath the base and thus take advantage of the physical forces involved, is practically without effect.

The writer believes this condition of the maxilla provides the single instance in which a vulcanite upper is permissible.

For this type of tissue the writer is accustomed to construct the denture in outline as in other cases, except that in packing the case neither tinfoil nor silex is used on the cast; the omission causes the finished denture to have on its surface thousands of microscopic nodules. He never begins the construction of a denture for this type of case until the patient clearly understands the results that are anticipated and also the kind of cooperation that he must be willing to give the operator. Before the dentures are inserted, they are moistened with water and sprinkled with powder gum tragacanth or gum acacia or with some one of the proprietary preparations sold for use in retaining dentures. The patient learns that this procedure must be repeated daily and possibly two or three times or oftener daily for a year at least, and perhaps for a longer period. The continued use of the vulcanite denture with its numerous nodules will be accompanied by an irritation of the structure immediately beneath the denture; this is at first acute but finally develops into a chronic pathological condition, and this in turn causes a resorption of the underlying osseous structure.

The writer thus presents briefly his theory of the action that takes place, but the practical result cannot be misinterpreted, namely, the hard tense tissues are changed so that a metal base denture may be successfully constructed. In view of the action upon the tissues in such cases it is hardly necessary to suggest that the writer can not emphasize too strongly the value of metal bases in preserving or promoting a healthy condition of the tissues.

PHAGEDENIC GINGIVITIS*

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APHAGEDENA is described in medical dictionaries as, "A form of ulceration in which the soft parts are destroyed rapidly in large masses." Phagedenic gingivitis then, is a type of inflammation in which considerable portions of the marginal gingivæ break down rapidly *en masse.*

Various terms have been employed to describe this disease. The term "trench mouth" is at present the term most commonly heard as a popular, rather than a scientific designation. Black, in *Special Dental Pathology*, employs the term previously used by Gilmer, viz. "acute ulcerous gingivitis". Black gives credit to Gilmer as being the first to write upon this subject. Hinman applied the term, "Vincent's angina" to the dental infection. This term cannot properly be employed to designate this disease for the reason that it is an accepted term for a definite ulceration of the faucial tonsil, and brings confusion when applied to the periodontic lesion. The fact that the gingival infection is frequently coincidental with the throat infection, and that the active organisms are undoubtedly the same, or the fact that both the tonsil and dental lesions may occur separately, seems not to alter this contention.

Grieves employs the term, "ulcero-membranous gingivitis." He gives as his reason, that "the terminology is most valuable which expresses the pathology." The writer while agreeing with this contention, offers the term "phagedenic gingivitis" and for the reason that the term phagedenic, not only implies an ulceration, but it implies a *rapid* ulceration of tissue *en masse.* The term, "membranous" implies that the attack is confined largely to the squamous epithelium which forms the mucous membrane covering the gingival tissue. A membrane is "a sheet-like organized structure." In this type of disease the organisms, while primarily attacking the outer epithelial layers rapidly penetrate into the underlying connective tissue, and not infrequently involve the crest of the alveolar process. The necrotic mass formed as a result is certainly not a true membrane. Nor is it a pseudomembrane such as that formed in croup or diphtheria. In these latter diseases, the so-called "membrane" is chiefly a fibrinous exudate, while in phagedenic gingivitis the necrotic mass consists of dead epithelial and connective tissue elements together with a true exudate.

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The terms "acute ulcerous gingivitis," "Vincent's infection of the gingivæ" and "ulcero-membranous gingivitis," while correct, are cumbersome. The term "phagedenic gingivitis" on the other hand, has the advantage of being shorter and more euphonious, and at the same time it more closely describes the pathology.

The term "phagedenic pericementitis" was introduced by Black in 1882, to apply to that form of disease in which pockets were formed alongside the roots of the teeth, the intention being to indicate the rapid and destructive progress of these lesions. He afterwards discarded it as being unsuited for the description of this condition. The meaning of the adjective "phagedenic," however, makes it particularly suitable in designating the type of periclasia under discussion.

Symptomatology—Phagedenic gingivitis is a pure type of periodontoclasia. It presents characteristics by which it may readily be differentiated from every other type of periodontal disease. While it is frequently observed in association with chronic gingivitis, suppurative pericementoclasia, etc., it occurs in such instances as a fusion-type.

The chief characteristics are: Sudden onset, a sensitive and painful serpiginous ulcer, consisting of necrotic tissue elements and a creamy pasty exudate, characteristic fetor of the breath; hemorrhages, either spontaneous or induced by touch, neuropsychosis, exhibiting malaise, mental depression, insomnia, restlessness, loss of appetite; profuse saliva often with a metallic taste and temperature above normal.

In the fusion-types there may be observed a variety of symptoms, which if correctly interpreted will aid materially in the diagnosis of cases, since they are distinctly symptomatic of the several complicating systemic and local conditions. In cases presenting a previous deep-seated gingivitis the ulceration usually involves both marginal and cemental gingiva, thus frequently exposing the crest of the alveolar process. Cases having a previous pericementoclasia which connotes a destruction of the pericementum and alveolar bone, exhibit a rapid loss of the alveolar gingiva overlying the previously-formed follicle or pocket. This produces an extensive ulcer, with exposure of the root surface and frequent involvement of the adjacent mucous membrane of the cheek or floor of the mouth.

The onset of phagedenic gingivitis is as sudden and intense as will be found in any acute fibril disturbance. The appearance of the oral symptoms is almost invariably preceded by a psychosis of several hours duration, which may be characterized by restlessness or an apparently causeless anxiety. If this occurs at night it will cause more or less wakefulness.

The pain which is frequently extreme, dominates all other symptoms, but may not be constant. The sensitiveness of the lesion however, is an ever-present symptom, and is so marked as to differentiate this type from the chronic forms of periodontal disease. There is also a hyper-susceptibility to mechanical irritation, no matter how slight. This factor introduces one of the chief difficulties in the management of cases in which crowns or malocclusion of any type are present. It also necessitates the attainment of the greatest delicacy in the use of instruments and the utmost perfection in the finishing of the tooth surface.

The ulcerous conglomerate is made up of necrotic epithelium and subepithelial structures, together with loosely-coagulated inflammatory exudate containing the characteristic bacteria of this type. It constitutes the greyish-white layer found on the crest of the marginal gingiva in cases of the pure type. This conglomerate may occur on any or all of the marginal gingivæ. It also may occur in widely-separated parts, the intervening gingival tissue showing no visible evidence of the infection. If this mass is removed a new layer is rapidly formed over the denuded surface of the lesion. Directly beneath this exudate and parallel to the border of the marginal gingivæ is a bright red line, beyond which the color of the mucosa may be nearly normal.

The odor which is imparted to the breath is characteristic, extremely foul and has a decided carrying power. It is readily distinguishable by one familiar with it even at a distance, as for instance, in a public conveyance. This carrying power of pathologic odors has been noted in other diseases, such as smallpox.

This disease progresses so rapidly as to involve the walls of the blood vessels before nature has an opportunity to protect them by the process of repair. Thus spontaneous hemorrhages frequently are encountered, this being shown especially at night by a staining of the pillow. It naturally follows that the slightest touch of the tooth brush, food, etc., will produce more or less profuse hemorrhage.

In phagedenic gingivitis as in all other forms of the fuso-spirillary infection, marked neuropsychic symptoms frequently are observed. Sleeplessness and pavor are almost universally constant. These cases, while usually presenting a temperature of one or more degrees of fever, and while affected to a certain extent by loss of sleep and pain, are not usually ill to the extent that they are actually incapacitated for work, or physically prostrated. Yet because of the neuropsychosis they will assert that they are extremely ill, unable to work, just able to walk, etc. And in fact they will admit of having almost any symptoms of extreme disability which the dentist may suggest. Insomnia in this condition probably is due more to a physchosis of which toxemia is the cause, than to physical pain. The mental depression bordering at times on melancholia, is of a very similar character to that exhibited by luetics during the early stages of that infection.

Loss of appetite is probably a part of the psychosis. It frequently precedes the development of the oral lesion but is more marked after its onset, since the mental state is then complicated by gastric derangement from ingestion of saliva contaminated by the inflammatory exudate, etc.

These cases often assume a profuse but intermittent salivation, covering a period of an hour or more at a time. The metallic taste of which patients often complain is characteristic of the disease, and is not due to the ingestion of mineral salts, inasmuch as it is as frequently found when no metallic medication has been prescribed.

The patient although not complaining of fever will as a rule admit that he is running some temperature. While the patient's sensations do not form a reliable guide in this particular, a recent checking up of forty-two cases showed the invariable occurrence of a temperature above the normal. In the average case however, this does not indicate a systemic involvement sufficiently aggravated to require special treatment.

This disease rarely occurs in women or in the aged; nor does it as a rule attack the hebetic. When it does occur in the female it is usually lacking in one or more of the cardinal landmarks, which renders diagnosis difficult.

Syphilitics are most susceptible to this infection. It must however be kept in mind that the fuso-spirillary infection may, and frequently does occur, without preparation of the host by the treponema pallidum, and is common among those who never have been subject to the latter infection. It is therefore unwise and in fact reprehensible to assume without positive diagnosis that these cases have a coincidental luetic infection. It has been observed however, in every case which gives a positive Wassermann, and which is at the time undergoing a course of salvarsan injections, that reaction to periodontic treatment is invariably so prompt as to be particularly noticeable. While this observation is quite true with regard to the arsenical salvarsan, the reverse is equally true when the salts of mercury and iodin are the therapeutic agents employed. In other words, it is usually necessary to materially reduce the dosage of mercury in order to obtain relief from the fuso-spirillary infection because of the irritating effect of these drugs on the inflamed gingivæ.

Phagedenic gingivitis is preventable, but the virulence of the organisms producing this disease enables them to attack tissues which previously have been so nearly normal as to seem entirely free from disease, not only to the patient but also to many dentists. Since immunity to this infection is only to be found in a state of perfect oral health, it follows that the only reliable safeguard is in periodic prophylactic treatment. As far as it has been possible to learn, no case of phagedenic gingivitis ever has developed in a mouth receiving periodic treatment from a competent oral prophylactician.

This disease is not only contagious but infectious. It may be transmitted by direct contact as in kissing. The sputum also is capable of transmitting this infection. Thus any article which makes direct salivary contact, such as a pipe, pencils, towels, eating utensils, etc. is capable of carrying the infection.

As in lues, the virulence of the organism is greatest during the period of exacerbation. But these bacteria when attenuated in one host, may by transmission to another, develop a renewed virulence. For this reason it should be kept in mind that after the acute symptoms have subsided there is still a possibility of recurrence and danger of contagion. Chronic and convalescent cases therefore should continue to observe the same precautions as during the acute attack.

In the operating room the presence of the fuso-spirillary infection should be dignified by the use of the same aseptic precautions as would be accorded to the treponema pallidum. An infected dental instrument such as an explorer or scaler may become a most insidious menace to public health. The writer has been interrogated by consulting patients as to the possiblity of this infection being carried by the dentist's instruments. It is well for dentists to realize that their patients are awake to this possibility.

In the absence of proper treatment the follicular or pocket-forming fusion-type produces fulminating symptoms which may be sustained for several weeks. Under these circumstances one of two things will occur. The patient will be able to develop immunizing antibodies, and thus either throw off the bacterial invasion or attenuate the organisms to such an extent as to reduce the symptoms to a subacute stage. Failing in this the body succumbs to the profound toxemia of the disease and the case progresses to a fatal termination. In the latter class of cases it is evident that the infection invades other tissues by way of the blood stream, due to the lowered systemic defense, the symptoms being those of a general septicemia.

The first lesion often occurs in the cuspid-incisor or bicuspid-molar embrasure, although the third molar is frequently the site of the initial ulcer. In the follicular fusion-type where the buccal alveolar gingivæ has been attacked, ulcers may occur in the adjacent tissues of the cheek, and may then be mistaken for melitis, leukoplakia buccalis, or lichen planus. In advanced cases the lesion may encroach upon the floor of the mouth or the lingual dorsum and may then be mistaken for Ludwig's angina or even a lingual carcinoma. Phagedenic gingivitis should, however, be easily differentiated from all of these by careful diagnosis. The submaxillary and sublingual glands frequently are involved and become enlarged and tender. The cervical lymph nodes also are usually involved.

While macroscopic pus is not formed in the earlier period, if the disease is allowed to progress to the subacute stage, infection by pyogenic organisms ensues. The result is the production of a suppurative fusion-type periclasia with deep destruction of proximal tissue rendering treatment difficult and tedious.

The pathology and bacteriology of phagedenic gingivitis is, in a word, the invasion of the marginal gingiva by the spirochete and fusiform bacillus of Vincent. The pathologic sequelæ are those to be expected in all rapidly-progressing inflammations. The formation of the characteristic ulcerous conglomerate is due to the extreme toxic effect of the organisms. This indicates a local virulence which is somewhat paradoxical in view of the comparatively mild systemic effect even in the acute stage.

Although fuso-spirillary organisms may be found in any mouth as reported by Miller, they do not always produce phagedenic gingivitis. When these bacteria are the true Vincent's organisms their lack of pathogenicity may be explained on the ground that their virulence varies from one cycle to another, and that only at intervals do they attain such a degree of toxicity as to be capable of producing this particular form of disease. The rapid progress of the infection accounts for the sloughing of considerable portions of the crest of the marginal gingivæ, the formation of an eschar when the slough has been removed, and sometimes the exposure of the alveolar bone. This is in contradistinction to the progress of chronic periodontal infections in which the absorption of alveolar bone proceeds at the same rate as the necrosis of the vascular tissues. The result is, that in the chronic inflammations, the alveolar bone nearly always remains covered by gingival tissue.

The fuso-spirillary organisms present an anærobic combination, a fact which naturally suggests an oxidizing agent as the rational corrective. In cases where diagnosis is doubtful or obscure, recourse should be had to the microscope, since the responsible organisms are almost invariably to be detected in smears, although a culture is the most reliable diagnostic test. This is of great importance, since treatment based upon an incorrect diagnosis, no matter how painstaking that treatment may be is very apt to do more harm than good particularly in this type of disease.

The etiology as in all other types of periclasia is compound, consisting of one or more secondary factors. It is a generally accepted fact that susceptibility to infection depends primarily on lowered tissue resistance. This may be brought about in two ways, either by exhaustion of the entire organisms or any of its parts, or by the action of some irritant. In phagedenic gingivitis the primary etiological factors are found to consist of mechanical irritants. And while there are many forms of mechanical irritation which might serve to prepare the tissues for the bacterial invasion, it usually will be found that the principal factors are traumatic occlusion and those irritants which act on the marginal gingivæ. The latter group embraces particularly those which are the result of neglect and dental restorative blunders.

A very important secondary factor in the preparation of the tissues has been brought into prominence during the recent epidemic of this disorder among the men who served during the late war. Nearly every case among these men, as well as in some who did not serve, admitted upon questioning that they were addicted to the habit of smoking a widely-advertised brand of cigarettes. It is not safe to infer that other brands of cigarettes or other forms of smoking are innocent as predisposing agents, nor is it possible to state with any degree of accuracy that the use of tobacco will be followed by this infection.

The role of the characteristic bacteria already has been mentioned. While this invasion is responsible for the striking phenomena of this type of periodontic disease and forms the dominating feature of its pathology, it is nevertheless to be considered strictly speaking, as a secondary etiological factor. This is evidenced by the apparently spasmodic selection of sites of attack. Proof of this is offered by the fact that a careful examination will reveal the presence of irritation and that the removal of irritation invariably is followed by recovery.

Alcoholics when suffering from this type of periclasia are a particularly difficult class to treat successfully. Whether the habitual use of this form of stimulant is a predisposing cause, we are not prepared to state. It has been observed however, that reaction to treatment in this class of patients is slower and less complete. The danger from this factor is however, becoming daily less formidable.

Trauma of the accidental or operative form will not prepare a previously-healthy tissue sufficiently to act as a nidus for this type of infection. Such preparation can only come about through the long continued action of an irritant capable of lowering the vitality and tone of the parts. An apparently spontaneous attack however, may take place in a tissue already invaded by the organisms; the infection becoming acute due to a subsequent lowering of tone of the tissues sufficient to permit of the full activity of the bacteria. In this respect it resembles the development of certain other infections such as pneumonia.

Treatment—The treatment of phagedenic gingivitis is founded on the same basic principles as is the treatment of other forms of periodontoclasia. There are two primary requirements. The first relates to the elimination of mechanical irritation including the sanitation of the mouth. The second relates to the elimination of the responsible bacteria. In other types of periclasia treatment is directed mainly to the correction of the primary or mechanical factors, the bacterial element requiring but little attention. The bacterial attack in phagedenic gingivitis is so violent however, that primary attention in treatment must be centered on the numerical reduction and attenuation of the invading organisms.

The fuso-spirillary organisms, while amenable to the action of the various types of germicides, are most effectively controlled by oxidizing agents. The most efficient one in the experience of the writer is sodium perborate. A germicide of a different type but a very efficient one however, is a combination of iodin and silver nitrate, introduced by

Dr. J. Frank Adams, of Toronto. Caustics and astringents are absolutely contraindicated.

The relief of mechanical irritation divides itself into the removal of foreign substances from the dental surfaces approximating the infected vascular structures and the maintenance of cleanliness.

Extraction, curettage or any operation producing a wound, is contraindicated during the acute stage of phagedenic gingivitis. If such operation is necessitated as a sanative measure it should be postponed until the case is fairly under control, otherwise there is grave danger of inaugurating a deep cervical cellulitis or a maxillary periostitis leading to necrosis.

The inherent recuperative power of the vascular tissues is such that almost immediately upon the removal of debris from the dental surface, and the maintenance of that surface in a state of scrupulous cleanliness, the acute symptoms will subside. Early instrumentation therefore is desirable, but must not be overdone. A contraindication against complete early instrumentation is the extreme tenderness of the tissues which makes it almost impossible for the most Spartan patient to permit the performance of a thorough operation.

In the management of phagedenic gingivitis the utmost intensity of endeavor must be concentrated upon the case. To temporize is not only futile but dangerous. The attitude of the operator should be as alert toward the infection as is the attitude of a fireman to a conflagration. The intensity of the infection requires a similar intensity in the way of treatment. As soon as the case has been diagnosed as a true phagedenic gingivitis, correction of traumatic occlusion if found to be present, is undertaken. This should be carried as near to completion as the patient's condition will permit. In a severe case it has been found advisable to follow this by application of the Adams treatment as follows: The area is isolated with cotton rolls or napkins and the tooth surfaces superficially dried. An application of Churchill's tincture of iodin is then made *to the tooth surface* with the aid of a small pledget of cotton in the pliers, allowing the liquid to flow by capillary attraction along the crest of the marginal gingivæ. A solution of ten per cent. silver nitrate is then applied directly upon the still fluid iodin. This is allowed to remain for about thirty seconds and is then washed away by the pneumatic spray. The chemical reaction between these two agents results in the formation of a nearly insoluble iodid of silver as is evidenced by the appearance of a bright yellow precipitate. It is interesting to note that iodin solutions or silver nitrate solutions when used alone are irritating, and therefore unsatisfactory therapeutic agents in these cases. Aqueous iodin solutions have a considerable penetrating power and consequently reach the deeper tissues, producing irritation. But their action is brief, due to their solubility and rapid washing away by the fluids of the tissues. Silver nitrate solution has a limited penetration due to coagulation by the salts and albumen of the tissues. When used in combination, these silver nitrates by reason of the affinity of the silver ion for the iodin, follows it to a considerable depth, neutralizing the iodin and being itself neutralized by the formation of the yellow silver iodid. In this way the maximum germicidal effect is produced with a minimum of irritation. The silver iodid seems to have a selective affinity for necrotic tissue and will produce a visable eschar on such tissue, while at the same time it produces no visible effect on vital cells. It therefore constitutes a valuable diagnostic aid in determining not only the extent of the disease process, but also the progress which is being made toward health. By reason of the formation of the silver iodid precipitation within the dead or dying tissue elements, there is set up an immediate inhibitory influence which tends to restrain bacterial proliferation and penetration. This results after one or two applications in the exfoliation of the ulcerous conglomerate, leaving a newly-formed protective epithelial covering for the marginal gingivæ. The bacterial zooglœa on the tooth surface becomes softened and swollen upon the application of the silver iodid, as does a sponge when it takes up water. And in this condition it is readily removed together with the excess silver salt by means of careful instrumentation. Unless it is removed at this time a typical silver stain is produced on the tooth surface.

Since one of the essentials of treatment is to secure and maintain the maximum of cleanliness and also to remove all calcareous deposits or other irritating foreign material, it follows that early instrumentation is necessary. Even at the first treatment a beginning should be made toward the accomplishment of these ends. But it is equally requisite that no injury to the soft tissues be produced. This caution regarding injury seems almost analogous to Portia's address to Shylock: "This bond doth give thee here no jot of blood; the words expressly are, A pound of flesh." "Take then thy bond, take thou thy pound of flesh." For slipshod use of scaling and polishing instruments or excessive zeal in this direction may do more harm than good. Yet the skillful and experienced operator will find no difficulty in choosing that course which will most rapidly reduce the bacterial media without increasing the burden upon the infected tissues.

Sodium perborate is prescribed for immediate use. This is prepared by dissolving a teaspoonful in half a glass of tepid water. The mouth is thoroughly rinsed with this solution at intervals of half an hour to an hour, to be continued day and night as far as possible, until the disappearance of the ulcerous conglomerate. Its use should then be continued for a few weeks, three times a day. It is of the first importance that the sodium perborate be fresh and of full strength. This is best accomplished by prescribing it in the original package. A fresh solution should be prepared at each time that it is used.

Further treatment may be summed up in the term, "oral prophylaxis." The removal of irritating foreign debris must be complete throughout the entire mouth, even where no lesions have occurred. Prophylactic treatment must then be given at frequent intervals, and continued until not only is the mouth restored to health, but the entire gingival structure has been regenerated.

While the loss of tissue during the course of an attack may be very marked, especially in the interproximal spaces, the repair of this tissue is to be looked for to a surprising extent under favorable conditions, speaking particularly of the approximal papillæ of the gingivæ. It has been observed that in cases where the interproximal alveolar border is not destroyed to any perceptible extent, and where the contacts between the adjoining teeth are normal, that repair and rebuilding of the lost tissues and restoration of the lost interproximal papillæ will proceed to the point of a nearly complete regeneration of the lost tissue.

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DISCUSSION

QUESTION: Does the regeneration of gingival tissue and pericementum take place in pronounced cases of trench mouth?

DR. STILLMAN: It is quite unlikely in my opinion, that the pericementum is ever regenerated. I am speaking now of opinions based on such histology as I am familiar with. The gingiva is regenerated to a surprising degree and for this reason: The gingival papillae, as in all other tissues contain cells which form and develop according to type, and if the type of cells which form the gingival papillae have not been destroyed, they proliferate if they have been cared for and nursed and the surface of the teeth do not irritate them, to an almost entire regeneration of the structure provided the bone underneath has not been destroyed.

QUESTION: Why do you use sodium perborate instead of peroxid?

DR. STILLMAN: Peroxid of hydrogen naturally would be the first thought as an oxidizing agent, because that is the oxidizing agent with which we are most familiar. But sodium perborate liberates oxygen slowly. The effect of the oxygen liberated by the solution of sodium per borate will remain in the mouth for a long time, whereas in the case of hydrogen peroxid it goes off like a seidlitz powder, and the effect is very soon over. We use sodium perborate because it constantly liberates oxygen for a long period, until the solution there has been entirely reduced.

QUESTION: Why does phagedenic periodontoclasia attack the special localities you name?

DR. STILLMAN: We know that no infection takes place without certain preparation. Our bodies are given immunity to infection to a surprising degree else we would not be here today; but if tissue is irritated, if it is injured, then it becomes susceptible, and it is noticeable in almost every case of phagedenic periodontoclasia that certain areas seem immune. If you will take the trouble to notice you will find those areas are also almost immune to irritation.

QUESTION: You state that early instrumentation in these cases is advisable, but must not be overdone. Will you further explain?

DR. STILLMAN: Injury must not be produced. We must not heap injury upon injury. These tissues are now in the state of an active infection, and it would be quite unfair in treatment to add another injury to the injury which is being caused by the bacteria.

QUESTION: Do yoú advise removing the tissue which has degenerated?

DR. STILLMAN: Yes, so far as possible, but not to the extent of causing hemorrhage. There is a large mass of tissue which degenerates on those ulcerous surfaces which I have termed a conglomerate, because it is made up of many tissue elements. If this white mass is removed from the ulcer much irritation may ensue, and yet in the white mass is the medium upon which the bacteria depend for their food. We know that bacteria do not proliferate on mucous surfaces to any great extent, but they do take hold and form plaques on the teeth and in the debris of the ulcers. We reduce the bulk, and all that may be washed away with the spray. I think that is all we should do when this tissue is rapidly degenerating. Cleanliness then is the secret of treatment in these cases.

QUESTION: How long does it take for a case to get well?

DR. STILLMAN: I will have to give two answers to this question. So far as the ulcer is concerned the cases respond most rapidly, and one not familiar with the cases would conclude that he had finished, and that the case was well. This is not so. The bacteria are still present and recurrence at this time is very likely to take place, particularly so if there is a continuing irritation of the tissues of some sort. So while in seventy-two hours, or forty hours perhaps, a large area of irritation could throw it off, and a new mucous covering form over the surface where it had been, still the case is not cured. The cases must be kept clean, the teeth must have prolonged treatment and prophylactic care. Gingival tissue will not regenerate if this is not done.

QUESTION: Do you regard it as necessary to have a bacteriological examination made?

DR. STILLMAN: I find in my practice it is necessary very frequently. One may make a diagnosis of these cases of phagedenic periodontoclasia because the type is so marked, and yet in all fusion types of diseases, that is, where two diseases go to make up the lesion, it is very confusing and if there is the least bit of doubt it is well, particularly well if a mixed infection is suspected.

QUESTION: Do you advise the immediate extraction of hopelessly-decayed or infected teeth?

DR. STILLMAN: There should not be extraction while the active ulceration is present in the mouth. The extraction of a tooth is harmful to the tissue, despite all care in extracting, and all injury to tissue at this time would be contraindicated. The extraction of a tooth would open up a large area that would be particularly susceptible in this type of infection to an attack of cellulitis or a periostitis.

QUESTION: Why are astringents contraindicated as remedial agents?

DR. STILLMAN: Astringents are irritating.

QUESTION: What is ulcerative stomatitis?

DR. STILLMAN: Acute ulcerative stomatitis is a synonym for phagedenic periodontoclasia.

QUESTION: What is meant by pure type periodontoclasia?

DR. STILLMAN: Periodontoclasia has five distinct types, of which phagedenic gingivitis is one. The other four types are ulatrophy, or simple recession of the gingiva gingivitis; pericementoclasia and alveoloclasia. Any one or more of these types may be found in combination. They are then known as a fusion type and may be analyzed into their components. These types are based on the pathology of the tissues. This method of classification is not yet published, but I feel when it is published it will be accepted, because as yet we have had no classification of types.

QUESTION: Would you advise systemic treatment?

DR. STILLMAN: What is the matter with the patient? That would be my answer. That is a Yankee answer. What is the diagnosis, would be the first question. What are you going to treat? No. Not systemic treatment for phagedenic periodontoclasia.

QUESTION: Why do you not recommend removal of the deposit and conglomerate tissue by dissolving them?

DR. STILLMAN: Because I don't know how to dissolve them.

QUESTION: Do you advise complete cessation of smoking, especially of cigarettes?

DR. STILLMAN: Yes, (Laughter and Applause)—during the acute attack (Laughter).

QUESTION: Time of incubation of bacteria concerned?

DR. STILLMAN: I don't know. I don't know how long it is from the time these cases are infected until the lesion breaks out.

QUESTION: How may you differentiate between phagedenic periodontoclasia and metallic salivation? Are the Vincent's organisms present in the latter case?

DR. STILLMAN: They may be present, according to whether they have taken hold. Every case must have diagnosis. The first important thing in the treatment of disease is to find out what you are dealing with. If the case is infected with the fuso-spirillary, we will know what to do for it.

QUESTION: How do you differentiate between phagedenic periodontoclasia and metallic salivation?

DR. STILLMAN: I have not had a very wide experience with the poisonings, lead poisoning, zinc poisoning. I have seen in the last twenty years perhaps ten cases of metallic poisoning. Since the match factory has stopped using poisonous metals, I don't think I have seen a case of poisoning of that character, in seven or eight years. The metallic poisoning shows a characteristic purple line about at the place where the cementum of the gingiva joins with the mucous membrane over the roots of the teeth. This color is characteristic and if you have ever seen it you will remember it. I feel that I cannot draw for you a word picture that you would carry away which would be of any benefit to you. They must be observed clinically.

QUESTION: Why do you not use Dakin's solution?

DR. STILLMAN: Dakin's solution in my hands has not proved a satisfactory material producing rapid clinical results. This fuso-spirillary organism is an anærobe. They will get out from under oxygen as rapidly as anything you can imagine. The constant washing with an oxidizing agent such as sodium perborate has in my hands given me the most rapid and satisfactory results, although I will admit that before I was familiar with it, other drugs—and there are many of them which do have satisfactory marked effects in the mouth. I offer you sodium perborate as the medicament which has given me the highest success clinically.

QUESTION: What results do you have with ten per cent. chromic acid in treating phagedenic periodontoclasia?

DR. STILLMAN: I haven't employed it. It was employed by the dental corps in the army with considerable success. I do not feel at this time that I would care to discuss that publicly any further.

QUESTION: Will there be any discoloration in the tooth structure from the use of iodin and silver nitrate?

DR. STILLMAN: There will not. The time it is left upon the tooth is short. A certain number of teeth are included in the treatment, and then they are immediately cleaned of all deposits, all plaques, and the silver iodid has the property of softening these structures and making them very easily removed. The silver iodid is said to be non-irritating.

PYORRHEA AND ITS TREATMENT*

BY THOMAS B. HARTZELL, M.D., D.D.S., MINNEAPOLIS, MINN.

THE MATTER upon which I am asked to speak is that of protecting our patients in the treatment of pyorrhea. I have had an ambition all my life to make dentistry somewhat better than I found it. I think the activating force that led me into that view was the continued failure noted during my college course and for some years after graduation, in the care of mouth infections; and the facts that I had the privilege of graduating in medicine in connection with my dental work, and have taught in the school of medicine in the University of Minnesota continuously since 1890, have kept me in touch in a rather broad way with human ills. I have had the privilege of serving with a group of men on the staff of the teaching hospital ever since we have had one, and instituted in the institution a course in mouth sanitation which has so convinced the members of my factulty in medicine of its value that they have established it on a firm basis, with a trained nurse, whose business it is to carry out the instructions of its supervisor, and train the other nurses in the principles of prophylaxis.

I was gratified at what I heard in the paper of your president, and I have but one suggestion to make on his recommendation to start a campaign for prophylaxis through the state for the laity, and that is, that he start that campaign by a very thorough and accurate training of the dental profession first of all. I have noticed that streams never rise higher than their sources, and that the average dentist does not pay enough attention to the condition of the human mouth to know when he sees infection.

I have been called into consultation many times by physicians to act on the work of previous dentists who had not recognized anything in the mouth to criticise. That condition among ourselves must be corrected before we can carry on a successful campaign among the laity, because we must know before we can teach others, and know much more than we attempt to teach.

It has been my ambition to simplify this question of pyorrhea. I want to touch for a moment on its history. During the past week I have been reading a little book that was published in 1701 by a member of the faculty of the College of Medicine, of Montpelier, France, in which he states some principles in regard to the treatment of cancer which have been neglected by the profession of the present day. I have found in books published long ago evidence of the fact that the men of a couple of hundred years ago understood the problem of pyorrhea, and presently, perhaps, I shall find that the very things we are trying to teach now were taught many years ago.

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*A lecture delivered before the Indiana State Dental Association, May, 1920. (Stenographic report by Mark Winchester).

I want to read a portion of a translation from the works of Pierre Fochard, published in 1746: "There is yet another species of scurvy, of which I think no other author has as yet had occasion to speak, and which, without affecting other parts of the body, attacks the gums, the alveoli, and the teeth. Not only are the soft, livid and swollen gums plainly affected, but those that are free from those vices are not exempt. It is to be recognized by a white, sticky pus, which can be made to come out by pressing the finger firmly from above downward, on the upper jaw, and from below upward, on the lower jaw. This pus comes out between the gums and the body of the alveoli, and sometimes between the alveoli and the roots of the teeth, which happens more frequently on the external surface of the jaw than the internal. We can refer, as the cause of this disease, to a rupture and disunion of the capillaries, produced by degeneration of the fluids that circulate through them. (That is Talbot's theory). These fluids have extravasated into the intermediary spaces, or in the neighborhood of some of the vessels, which they have affected; and they break down, forming ulcers or fistulas. From this source is derived the prurient matter which is seen to issue from between the teeth and the borders of the gums. The effect is that those who have treated this disease with external remedies never succeed in curing it, which might give rise to the opinion that the disease comes from an internal or systemic cause. To assure myself of the incorrectness of this conclusion I have noticed that wherever the teeth have been lost from this disease, the alveoli and the gums become so well re-formed that no pus comes from them. I should conclude that this disease cannot be radically cured until the defective teeth are out of the mouth. (With that I disagree). Keep the mouth clean, lance the gums when necessary, rub vigorously each day with a finger dipped in an astringent. It is necessary to cleanse the mouth well after each meal with a little water and wine mixed together. (You can't do that now!) Be careful and bear down firmly with the finger on the gums in rubbing them to expel the pus."

That is a good picture of pyorrhea, isn't it? and it was written in 1746! A little rough as to his etiology, but when you think of the period in which it was written, you find it to be a classical picture.

It was once my fortune to sit beside Dr. L. D. Shepard, who was a personal friend and a member of the same society with the late Dr. Riggs, and he gave me the "transactions of the Connecticut Valley Dental Society" as a present. In these "transactions" I found a resolution which gave Dr. Riggs great credit for a new and successful method of treating pyorrhea, and the occasion of the receipt of that gift by me was that I was making an address upon this same subject in the city of Boston, where Dr. Riggs lived a part of his lifetime. The donor of the book was a close personal friend of Dr. Rigg's who saw him operate.

I mention these things that you may know that I am not taking a narrow view of the subject we are about to discuss, and that I appreciate that the disease itself is as old as mankind; also that much good has been done in the treatment of pyorrhea by the men who have gone before. I do believe, however, that we have succeeded less well with it than with almost any other disease commonly known.

My endeavor has been to try to determine the cause of this failure, and I think it is chiefly because we have not understood its etiology. If we have understood its etiology, we have not acted upon our knowledge.

I am going to make a few dogmatic statements. I believe them, and believe I have documentary evidence and laboratory experience to prove every statement I make. I am going to make the broad statement that pyorrhea *could not exist* except for the bacterial growth on the teeth. It would be impossible to have either a pyorrhea or a gingivitis of continued presence without bacterial growth on and around the teeth. *Bacterial invasion* of the tissues is the great factor. There are three or four other factors in the condition we are discussing as pyorrhea. Briefly, they are malocclusions, which create congestions which make easy the invasion of the softer tissues by the bacteria growing on the teeth. The matter of diet is a very great factor. I do not know whether to rank diet or malocclusion second. I rank bacterial invasion first. Malocclusion and diet are about equal in their power to reduce the vitality of the tissues and permit bacterial invasion.

Those of you who know anything about the northern countries of Scandinavia know that among the poor who have meager plots of land, and who grow a comparatively small amount of crops, and who take their goats to the mountains in the summer, they do not lay up a store of vegetables sufficient to carry them through the winter. The children come through the winter into the spring with gums inflamed and swollen, and hanging away from their teeth; and they do not improve that condition until the oranges come in from Spain, and they get the acid that is necessary to remove the bad effects of their faulty winter diet.

You who follow the work of Howe, who has told us he could feed guinea pigs on a scorbutic diet and produce inflammations of tremendous import, will readily understand this condition. You who listened to Major Wells, of Toronto, who came to our city recently with a paper on "Scurvy and Rickets," in which he showed us the pulps of many teeth of guinea pigs and monkeys which had been killed by placing the animals on a scorbutic diet for two or three weeks, and tremendous bacterial invasions produced, and who exhibited pictures of animals and of cuttings of jaws which showed rapid correction of inflammations in these localities by anti-scorbutic diets, will understand this condition. Or if you have followed the work of Mennell, of Harvard, and of McCullom, of Baltimore, who have been experimenting with diet on animals with rickets, you will admit that the proof is well adduced; that we can create conditions by faulty diet, that lead to swift bacterial invasion, and aid in the production of pyorrhea.

It is equally certain that when you break the dental arch and produce a malocclusion, in which the forces of occlusion amounting to about seventeen hundred pounds a day, as Dr. Black told us, and in many mouths amounting to a ton or two, congestions are induced that make bacterial invasions easy.

Accept my word for the fact that bacterial invasion is *positively essential* to pyorrhea. Does the dental profession realize that? Do we teach that to our patients before we begin to treat for pyorrhea? We should teach the patient that pyorrhea depends on bacterial filth in the mouth. If we do not, are we fair to him? In order to succeed in the treatment of pyorrhea, we must carry to the patient a comprehensive knowledge of his condition; make him realize it. We must tell him what causes that condition, and enlist his assistance in fighting it. The simplest way to do that is to change the terms "bacterial invasion" and "bacterial masses" to "mold." Every housewife knows what mold is; every farmer knows that moldy corn will not sprout and grow and will cause disease in animals to which it is fed; the millers in the mills who have to keep their millstones and rolls clean, know that mold is objectionable. Nearly everyone knows that mold is a form of parasitic growth that is inimical to the best interests of anything upon which it appears.

I am going to give you a little chapter of experience which I hope will help you. *It is useless to treat pyorrhea as we have been treating it.* I have made a lot of mistakes. I recall the time when I thought it necessary to treat pyorrhea with instruments only, and I thought it necessary to have a certain kind of instrument, and that if we did not have that kind of instrument, we were damned.

There is nothing in that.

If I were given the choice of treatment by a man who understands how to teach me the bacterial origin of pyorrhea, and how to prevent that bacterial growth from day to day, or the treatment of a man who does pyorrhea treatment with one hundred and fifty planes or scrapers, without having a comprehensive idea of why I have pyorrhea, I would go to the man who *does not use a steel instrument at all;* because, in the University Teaching Hospital, where I have had eighty beds under my care for five or six years, we take the average case of pyorrhea or gingivitis, and without the use of instruments except in the very limited way mentioned later, we expect all the bleeding and almost all of the pus-flow to *stop in ten days*! Why? Because we teach those patients how to take the bacterial mass off the teeth and *keep it off*, and then the pus-flow ceases, and the gingivitis gets well of itself.

I draw your attention to the fact that when you have a hernia, you build it up by overlapping the fascia and stitching them together to hold the hernia in. If you treat that hernia with ordinary catgut, the catgut is absorbed and the hernia bursts through again. So we have to use a different catgut, sometimes "twenty-day gut," and sometimes, with a big hernia, "thirty-day gut," because these each have been prepared so that it takes twenty days of effort by the absorbing cellular organisms to break them down, or thirty days, as the case may be.

As soon as you have established the habit of absolutely cleansing all of the teeth from the masses of bacteria that grow on them, which I tell my patients is mold, so that there is no more ingress of mold under the gum, immediately the circulatory organisms in the ulcer begin to absorb the deposit, and at the end of six or eight months most of those bunches of calculus are gone, just as the catgut is eventually taken up in the abdominal wound.

I do not advocate waiting and leaving those masses of calculus on the roots, for Nature to handle, because it is a short cut to take them off and stop all pus-flow in a week or two—within a day or two, oftentimes. The deposit on the root is the result of inflammatory action. It is poured out into the wound, and the acid excrement of the bacterial growth precipitates it, and it is glued onto the surface of the root by the mucin, which acts as a holding agent; and the minute you cut off the bacterial invasion and the inflammation stops, Nature begins to do what she always does, correct the irritating agency by absorbing it.

There has been great progress made in our actual knowledge of mouth growth that is inimical to the body. I am going to make a brief statement of the damaging bacteria I know to exist in the mouth Roughly speaking, half the growth on every tooth-neck is streptococcus viridans; one-fifth of the growth is staphylococcus. The balance, thirty per cent., is made up, in the order of their damaging possibilities, of pneumococci, fusiform bacilli and accidental thread forms. I mean that the latter type of bacterium is not a constant inhabitant of the buccal cavity, and is not always present.

The human mouth is born sterile. Blavatsky, of the Pasteur Institute, published a splendid paper on that subject in 1915. The human mouth is sterile at birth. It takes up streptococci as soon as the baby's mouth goes to the mother's breast, because on the skin of the nipple there is an abundance of streptococci. Streptococcus is almost universal; it is in the dust of the streets, in the dust of our homes, everywhere, always. These little cheeses that are wrapped in blue ribbon and tinfoil and which look so good to eat, are about half streptococci. And milk! I once served on the Hennepin County Milk Committee. Farmers used to bring in milk that would run a million bacteria to a centimeter! The idea of feeding babies milk like that! It was mostly streptococcus viridans, the greatest acid maker of them all.

Here is a little legend about the importance of bacteria: Why don't you know about it? Why isn't it a living entity to you? It is because you don't appreciate it. The subject of bacteriology is the most important subject of which I know anything. Human life on this earth would of course be impossible if it were not for bacteria. None of us would be here if it were not for bacteria. Why? Because every bit of cellular construction, the oak tree, the flower, the plant, the human body, the animal body, without the action of bacteria *never would decay.* True, the human body might dry up, like those found in the pyramids, but it never would disappear. The plant, the flower that blooms today, would dry up, but it would lie where it fell until Gabriel blew his trumpet; and the oak tree would stay until the end of time; and that blanket of undelayed vegetation would kill out everything necessary to support life, and we shouldn't be able to live here.

Why do those things go back to the soil? Because the Lord in His wonderful knowledge of what was needed to support life in its endless cycle created the little insignificant bacterium, which takes each cellular element back into the soil—tears it down and sends it back, to be used over and over again. I don't know but what parts of my body may have been used fifty thousand years ago to build the body of a red Indian or an animal. These bacteria make it possible for us to go on and live and propagate. The principal work of a bacterium is destruction, and if it becomes a parasite, it destroys whatever it is on.

It is said that, "A clean tooth never decays." What do we mean by a clean tooth? One that is white and shining? No. What we mean is a tooth on which bacteria are not growing. There are just two things to remember about the destructive power of bacteria as far as the teeth are concerned. The destruction of a tooth surface, coated with enamel, depends on the excrement of the bacteria, which is acid. If it were not for that acid excrement, the tooth itself never would break down. The destruction of its environment and the formation of pus in the soft tissues depend on digestive ferments. Such ferments have the power to turn the fixed cell into a fluid on which it may live; and so it tears down, and, unfortunately, it does something the soil bacterium doesn't do. It has two methods of attack. The excrement of the soil bacterium is a good thing and helps the soil, feeds it. Its destructive or its disintegrating power is its valuable characteristic. But the excrement of the mouth bacterium is bad, because it dissolves the enamel coat, and opens up the way for congestion and the subsequent loss of the matrix.

In talking with my patients as they come in, I say, "What I mean by a clean tooth is a tooth free from mold." If you talk about bacterial masses, they smile, but do not understand, and of course do not act upon your word. I remember one old professor who taught me—he was a Dane. He used to say, "Use your eyes, and your nose, and your taste; use every faculty you have in diagnosis." Once, when doing a gall-bladder operation, to illustrate his point, he touched a finger to the bile, and then touched his tongue, and we all did the same! Then he said, "You fools; didn't you notice that I put a different finger into my mouth than the one with which I touched the bile?" That lesson never left me. When I have a patient who has a dirty mouth, I tell him first that his mouth is unclean. The fastidious ones at times are offended. Then I take a scraper and scrape the tooth and put the scraping on the index finger of the patient, and tell him to roll it around between finger and thumb until that bacterial mass is well kneaded and smeared, and then tell him to smell it. That is a good way of impressing the patient with the fact that there is something on the teeth that is objectionable. Then I take a disclosing solution and flow it on about a quarter of the teeth, give the patient a mirror, and say to him, "When I shoot a stream of water over those teeth, wherever they are free from mold the stain will wash off instantly." And in every pyorrhetic mouth, unless the patient scraped his teeth just before he came to the office, we will find great masses of mold and bacterial life.

The next step is to teach him how to take off the mold, and if the patient understands the relation of the mold to pyorrhea, it is easy.

Ordinary instrumentation and depending on the patient coming to you once a week or once a month for several years maybe, is begging the question, and you eventually lose out. Whereas, if you teach the patient the etiology and visualize it to him, and in commenting on the situation say, "If you had a servant so careless as to serve food in that condition, you would at once discharge that servant," and, "How can you bear to put those teeth through your food when they stink, and rub that stinking stuff into the food that goes into your stomach?" you will get real results. I appeal to my patients by every possible means to create distaste for the condition present in their mouths.

After doing that I take a tooth brush, and teach them how to take off the bacterial masses and keep them off; and I get a promise from them that they will spend fifteen minutes of every day in maintaining a condition of bacterial and mold freedom. If they refuse to co-operate, I extract the teeth. I am not in sympathy with those who are practicing pyorrhea treatment and having their patients come back once a week or once a month for long periods. I teach my patients that if they do as I direct, they need come back only once or twice a year to have the calculus removed that is deposited in such positions that they can not reach it; and I teach them that when they are once cured, they are cured "for keeps." I am endeavoring so to simplify the treatment of pyorrhea that it will be treated successfully and completely eradicated.

Unless you grasp the common fundamental facts about bacteriology, and use them for the benefit of your patients, you are far from fulfilling your function as dentists. I have been called to speak to as many medical as dental associations in the last few years; and the medical men of New York, in their one hundred and eleventh session, when I took part in the symposium in discussing the glandular infections of the body, giving my views from the mouth standpoint, told me that they welcomed me because they realized that dentistry was a speciality in medicine, and they gave me the right-hand of fellowship. And they are trying to give you the right-hand of fellowship. The trouble with the dental profession is that we have been called to the wedding, but we haven't put on the wedding garment. The way for dentistry to get this garment on is to accept the fact that the bacteriology of the mouth is a potent thing, lying at the gateway of success as a specialty. We want to make potent use of this type of work in the mouth, and the moment we become able to teach our patients the reasons for things, we will have the most delightful period of practice we ever have experienced. Nothing can give greater satisfaction then to treat a case of pyorrhea or mouth infection, in which the teeth are loose and wobbly, and actually see them tighten and stay tight and quickly return to normal.

A few weeks ago I held a clinic in my office during what is known as "Medical Week." There were four thousand physicians from the Northwest, from Montana, the Dakotas, Wisconsin and Iowa invited. All the men in the medical profession who have anything to offer are asked to give a clinic during "Medical Week." As I belong to the Medical Society I volunteered this clinic: I sent out into the country and asked a farmer who had been a patient of mine a year before. He had been sick for two years and was running a temperature. His physician did not want to operate, and sent him to me. I found his teeth coated with mold from the cutting edges to the gums. The teeth were very loose, and I recommended extraction. This man was a Hungarian. He never had seen a tooth brush, much less owned one. I said; "John, your mouth is full of mold. Do you know what mold is?" "Yes." "Your teeth are moldy. Those teeth are so loose they should be extracted." He said, "I don't want them extracted." When I got ready to extract, he backed away, and begged so hard to keep his teeth that finally I said, "If you will do exactly as I tell you, there is a chance that you may keep those teeth."

The central incisors below had less than an eighth-inch of attachment in the socket; they wobbled badly, and I thought I was foolish to leave them in; but he pled so hard that I consented to do so. I showed him the moldy coat. I removed the calculus and taught him how to use a tooth brush. I got a promise from him that he would brush the teeth twenty minutes a day. It now has been a year since those teeth were treated, but they are as rigid as you could expect teeth to be that had less than a quarter of an inch of good bony socket, and they have been in hard and constant use. He has gained thirty pounds in weight, has gone back to his farm and is working like any other man. He came up from the country, spent a night each coming and going, and a day in my office, and showed his mouth to fifty physicians who visited me during the two days of my clinic.

His brother had the same type of case. In the molars in each case the bone was so badly absorbed I could push an instrument through between the molar roots, and yet those teeth, last week under the disclosing stain, showed nothing abnormal. They are solid and rigid, and the men are chewing on them. These men told their story over and over again to every one of those physicians who was interested.

The method of my clinic was to splash disclosing stain on the teeth of one of those doctors and say, "This is streptococcus, staphylococcus, pneumococcus," and so on. And then I had them put their fingers on the teeth of those two men and test them. After putting disclosing stain on the teeth of the physicians, I took a tooth brush and cleansed their teeth myself. I believe it was an effective lesson.

I could bring you a hundred cases that have been cured of pyorrhea, and cured for from one to five years. The secret is in demonstrating to the patient that his teeth are moldy, teaching him how to keep those mold masses off, and helping him to form the habit of keeping them bacteria-free. Whenever patients come back to check up, if there is a spot they have missed I call their attention to it and clean it myself. Frequently the anterior half of the mouth is clean, but the molar teeth are unclean; or perhaps the whole mouth is clean except the back of the third molar. I teach them how to clean those places, give them a prescription for disclosing stain, which I advise them to use twice a week after they have cleansed their teeth, to see whether they have taken the bacterial mass off. The whole secret is to get rid of the bacterial growth and keep the teeth free from it.

I want to discuss a little further this question of the cause of pyorrhea. Malocclusions certainly ought always to be corrected. You demonstrate malocclusions by the use of carbon paper, by taking casts, by mounting the models on articulators, and studying the occlusion; and then you must correct it. Every line in a human tooth means something; remember, that every curve and contour has a purpose. The "tin-can crown" never was meant as a preventive of gingivitis! One of the most encouraging signs of the times is that our dental teachers are dwelling vigorously on restoring toothform in such a way that all of the protective lines of the human teeth are re-created in the crowns, instead of making them a mere slip-on cap.

All types of mechanical irritation around teeth must be eliminated if the bacteria are not to break through the doors made by the congestion caused by such irritants.

There is a group of men who grind and polish teeth a great deal. They grind them so much that at times they ruin them. There is one simple rule for mechanical interference in treating pyorrhea that stands, and it is this: Cleanse the teeth carefully with a tooth brush; apply disclosing stain, and wherever disclosing stain is retained on the teeth it will be because the acid created in the course of bacterial growth has etched little shallow furrows or serrations in the tooth surfaces that hold and retain the bacteria that the brush can not reach. Then take a stone, sharpened to a point by holding a fissure-shaped carborundum stone on it, and go after those little areas that still contain the stain, and level them out. The Lord didn't intend that we should grind those teeth much, and you are only grinding them to make it possible to sweep the bacterial growth off with the brush.

Why is it that these bacteria accumulate so rapidly and so constantly? The streptococcus in glass is seen to double about every twenty-two minutes; in the mouth every thirty-five minutes. Its excrement accumulates to a point where it acts as detergent to further growth. If it were not for that the bacteria would completely fill the mouth in a short time; but they cannot go on multiplying. They limit themselves.

I will give you the prescription for a disclosing stain. I will ask you to use it systematically for one month. Then if you have the heart to give it up, you deserve to go where I know you will go! The following is a prescription for one ounce of the solution; fifty grains of iodin; fifteen grains of zinc iodid, fifteen grains of potassium iodid, four drachms of glycerin. Put these in a mortar and triturate them until they are smooth. Then pour out that mixture and take four drachms of water and wash out the mortar. I have dictated this carefully, because I have seen that prescription published many times, and seldom correctly. If you mix all the ingredients together and pour the solution all out at one time it won't stain the bacteria. The reason is that the glycerin sticks to the mortar, and holds a lot of the salts. You don't get it all, and of course it is not right. The *compounding* of that prescription has everything to do with its value. The solution is exactly right. It will not burn the tissues, it will reveal the bacterial mass, and it is healing for turgid and swollen gums. Use the four drachms of water to *wash out the mortar*, and get it all out, and you will have a solution you will enjoy using. Give this prescription to the patient, first demonstrating to him the bacterial masses on the teeth by using it. Observe that when you flush it off the teeth and find stained masses over little oval white decalcified areas that you will soon learn to know, without using the explorer, where to find cavities.

If the sainted Dr. Black had only made the idea stick, which he did not although he tried hard enough, he would have adopted a different slogan than "Extension for Prevention." He never would have needed to teach extension of the cavity cutting for prevention if he could have gotten this idea to stick, because it is not necessary; but it was too early. I don't know whether you are ready for it even now; but if this idea sticks you will give up extending cavities for prevention; you will clean the teeth for prevention, because the only thing in the mouth that makes cavities is bacterial mold. Your worst pyorrhea pockets are between the teeth, because the bacterial masses there are heaviest because undisturbed and hardest to remove.

In using the tooth brush start working the bristles in between the teeth. We want a brush with wide spaces between the bristle-tufts and rows, and with stiff bristles, so they can be inserted between the teeth. The bristles must be worked in between the teeth to displace the bacterial masses that reside there.

In cleaning the upper teeth, place the tooth-brush points away from the gum, and let a tuft of bristles extend beyond the last tooth. With a gentle jiggle move the tooth brush a little back and forth, about the sixteenth of an inch, until the bristles slip up the contoured convex crown, and fall in between the teeth. Then drive them in with force by a little short movement, and press the sides of the bristles against the gum, and let the tooth brush work back and forth. It is a great mistake to move it too much, as the bristles do not remain in place but leap in and out. That injures the gums, and does not cleanse. The bristles are to be deflected away from the gums. They must slip by with gentle pressure until the bristles have entered the spaces between the teeth; and then, when entered, deflect away from the gum; squeeze them in far enough so that the spaces are filled with bristles, so that the sides of the bristles cleanse as well as press the gum. If you had a swollen finger, you would not massage it toward the finger tip, but away from the tip. You would drive the fluid out of the finger back toward the heart. If we gently slip the bristles in between the teeth and with gentle pressure squeeze the gums a little, we empty out the congested blood, and carry the bacteria which are massed in the gums out into the circulation where the phagocytes can attack and destroy them.

I have had three classes in the Southwest recently, and started thirty men each time with a case. We started by putting a patient in the chair, and after giving him an idea of the cause of pyorrhea, I asked each one of the class to demonstrate to the patient what I have been telling you. I had asked members of the class to bring their pyorrhea instruments with them, the ones they could best work with. I said to them, "Carry the first patient through the entire week with nothing but mouth and tooth cleansing as described, and the other ones you may operate upon as usual with your instruments." We endeavored to make diagnosis and prescribe what should be done for every case. At the end of the week those men without exception said, "Where can we buy tooth brushes?" They had less use for their instruments.

I don't believe there was a single doubter among the hundred men. They were so won by the logic of the situation shown by that single case for a week that they all wanted these tooth brushes. My brushes are not perfectly ideal, but they are the best I can buy.

Patients will come back exhibiting areas that they cannot cleanse with the brushes they have. Then get brushes that they can cleanse them with. For the inside of the arch it is better to have a small brush. Most makers make them too big and clumsy, and the bristles so packed together that you cannot insert them between the teeth. The patient must be willing to give as much time to the work as is necessary, at least fifteen minutes a day. If the patient has a space between molars that he cannot reach with a particular brush, supply him with a smaller brush that he can get into that space. It has been a joy to see the results of this treatment.

Where are the brushes to be had? you will ask. The Canadian Oral Prophylaxis Association has been making good brushes. Up to the time the war broke out you could buy the proper brush for thirty-five dollars a gross. I have bought many gross. I tell you that to show you I am practicing what I teach. Now, who originated this brush idea? Dr. Henry Barnes, of Cleveland, Ohio, first wrote a paper on interdental brushing. His scheme was to prepare little brushes, and insert them between the teeth, and he advised keeping the brushes soaked in water. The men who followed Dr. Barnes and grasped that thought and amplified it, are Drs. Charters, of Des Moines, and Morton, of Milwaukee. I have been doing this more or less successfully for some years, and am prepared to say that is the greatest single advance in the production and maintenance of clean mouths that has been made in the last fifty years.

I said that diet affected the condition of immunity from or ease of bacterial invasion, and it surely does. One of my friends in Minneapolis said a few days ago that he had no use whatever for a tooth brush. He said he controlled such conditions by diet. Analyze that thought. Can you influence any great number of people as to diet, and get them to maintain it for any length of time? Diet is a matter of habit cultivated from the cradle up; and while you may advise people not to eat too much sugar, and salt, and fats, and heavy meats, and to eat more grain, fruits and vegetables, you have no assurance that they will do it. You will not have much success in trying to influence people toward diets that are markedly different from that they are following. You can create a new habit much easier than you can break up an old one.

Eating certain kinds of food is a habit of the palate, and it is discouraging to try to change a diet in a patient; but I can create a new habit without much trouble.

An advertising dentist attended one of my clinics. I did not know who he was. Three of four days afterward he came back. He said, "Dr. Hartzell, can I get some more of those tooth brushes?" "Yes, you can buy them, or if you want some of mine, I will let you have them." He got three or four dozen. He said, "It is the first time I have had the feeling of a clean mouth, and I want some of these for my own use until I can get some from the manufacturers, and I want to use some of them on my patients."

The grinding of teeth to secure good occlusion is to me the hardest thing in the treatment of pyorrhea. I can stimulate the interest of my patients and hold them to the following of my instructions very well; but I cannot always tell when to grind and when not to grind teeth to correct occlusion. In a nutshell, however, my treatment is this: *Maintain a clean mouth. Learn to remove bacterial growth. Teach the patient the importance of it. Explain the method with tooth brush in place in the mouth; place and hold it there yourself; use the tooth brush in the patient's mouth yourself. Keep at it until you know that the patient can use it properly.*

In the past year I have had some blood pressures of two hundred and thirty and two hundred and forty fall to normal on removing the bacterial mouth-factor. Of course, there are many other things that create hypertensions besides mouth infections; but when mouth infections are found, and you correct them, you are doing your patient a very great service.

When you insert an instrument under the gum to remove deposits of calculus, be very gentle about it, and don't cut too deep. You had better cut too thin than to open up the cementoblast in the cementum to infection.

DISCUSSION

QUESTION: Is it necessary to remove surgically the diseased gingival tissue?

DR. HARTZELL: It is not. The moment you get and maintain a germ-free surface, that tissue becomes of great value. When you lay bare toothroots you expose them to heat and cold, and that is very painful. It is better to preserve the gingival tissue. If you stop the bacterial growth, you don't need to remove it.

QUESTION: What about dental floss in proximal spaces?

DR. HARTZELL: That is needless after you learn this method. And it often does harm, because you sometimes increase the infection and irritation with it. It is slippery and does not cleanse very well. Try using dental floss and then use disclosing stain, and see of how little advantage it is, particularly on an etched surface. I have discarded dental floss.

QUESTION: Would the use of bacterins be of any benefit in treatment?

DR. HARTZELL: No. Whenever you have a case of secondary infection or a case of pyorrhea, if you want to use the most valuable bacterin that science has devised for correcting a case or increasing immunity, space the time between pyorrhea treatments about as you would if giving the bacterin, and you have a much greater response to the living bacterin, applied by rubbing the instrument in the sore, than you could possibly get from the best purchased bacterin.

QUESTION: What is the name of the brush company?

DR. HARTZELL: Irvin Smith Company, No. 6 East Lake St., Chicago, make these stiff-bristle brushes, except one, which is made by the Canadian Oral Prophylaxis Company, A. J. Broughton, Toronto, Canada.

QUESTION: Why not teach your patient to use tooth picks?

DR. HARTZELL: I haven't any special objection to that, but it would be slow and inefficient as compared to a properly-constructed brush.

QUESTION: Do you use any powder or paste?

DR. HARTZELL: I always use a paste or powder on the tooth brush, and I prefer a paste because it sticks to the bristles, and you fill the brush as full of it as you can because it is the sides of the bristle as well as the end that is scouring between the teeth, and the scouring element should have some adhesive quality. I am using Pepsodent, because it contains Indian gum and sticks to the bristle well. I am lately using a soap (Kolynos) followed by a salt solution.

QUESTION: How do you treat deep pyorrhea pockets?

DR. HARTZELL: Exactly the same as I have indicated. If the case is in the hospital and I haven't time to use instruments to take away the deposits, then I teach the patient the necessity of keeping his teeth clean, and turn him over to the nurse, and she sees that he goes through the brush operation every day. If I have time I go into the pockets and remove the deposits, but you cannot always do that, and I have found after a few months that people who keep their mouths clean get along about as well as those we operate upon. The deposits eventually disappear.

QUESTION: Is gum and alveolar resection advisable in medium or extreme cases?

DR. HARTZELL: I have yet to see the case in which I believe it advisable, because it lays bare the root suddenly to thermal changes, and it makes more root to cleanse after you have it bare. If you have conquered the bacterial growth on its exposed portion, the bacterial growth in the sore is rapidly destroyed by the lymphocytes, and you have preserved a certain amount of gum to protect that root.

QUESTION: Do you find wild yeast in a pyorrhea case?

DR. HARTZELL: You can say that all bacterial growths in the mouth are yeasts.

QUESTION: How do you account for the fact that some people who never use a tooth brush are free from pyorrhea?

DR. HARTZELL: I do not know that I can account for it. There has been since the beginning of time, recorded in the teachings of great men of ages past, a mighty difference in resistance to disease by human beings. You have noted families where there has been exposure to diphtheria; one, two or three have taken it and perhaps died, and the others have not taken it. You will find families drinking water with typhoid in it. Some of them take typhoid, and some don't. It is because the individual who does not take the typhoid has better mechanism for destroying the bacteria than the one who yields. That is the reason why certain mouths that are full of bacterial growth do not have pyorrhea. You probably would find in such mouths low grade bacteria, because the individual producing that bacterium has a mechanism that produces a substance which holds them in check and lowers their vitality. We call that immunity.

QUESTION: In speaking of John's case (the Hungarian farmer), what do you mean by "those teeth were cured?"

DR. HARTZELL: I mean that one year ago the man had a bad case of pyorrhea, and that since that time his gums have become hard and firm, the teeth tight and comfortable, and the mouth sweet and clean.

QUESTION: What diet do you prescribe for you patient?

Dr. Hartzell: If it is a case in which there is a great deal at stake, I write out a diet that is advisable for that particular case, but my general instruction is covered by the following: The minimum of fats, sweets and heavy meats; the maximum of fruits, grains and vegetables. When you are dealing with a human entity it is difficult to arrange any diet that a patient will adhere to very long. But if you give him a solid reason in a general way for not taking quite so many heavy things and fats and sweets, and leaning to the fruits and vegetables, you may get him to change. If it is a case where large disaster is coming from a faulty diet, I come down hard, and say, "You must follow this diet or quit." It pays to take into consideration everything the patient has been eating before you order a new diet. The fluid intake is important. I have seen cases of pyorrhea made possible because the patient did not take as much fluid as he should during the day. Every individual should take two quarts of fluid in twenty-four hours, and most of that fluid at least one hour before meals, so that the gastric juices may not be diluted by the water at meal times.

Question: Please make more clear the use of disclosing solution.

Dr. Hartzell: You must splash or paint the solution on part of the teeth, and you had better splash it on a quarter of the mouth at a time, because it is dissolved out quickly by the saliva; splash it on a fourth of the mouth, inside and outside of the arch; then take a water syringe and flush out with water. The clean places stand out white, and the other places appear as though they had a coat of buffalo fur on them.

Question: Would salt be a good thing to use with brushes?

Dr. Hartzell: One of the very best.

Question: Is it always true that "A clean tooth never decays?"

Dr. Hartzell: It is. Enamel is the hardest substance we know, and it won't break down without some substance to break it down. If it is perfectly clean, what can break it down?

Question: Does the Carrel-Dakin solution sterilize the mouth when used on the brush?

Dr. Hartzell: There isn't anything in the world, so far as I know, that will sterilize a mouth. You can reduce the bacteria greatly by that solution and other antiseptics, but you cannot sterilize the human mouth with anything as far as I know.

Question: In pyorrhea cases where extraction is indicated, how many teeth would you extract at one sitting, and what method would you use?

Dr. Hartzell: It would depend on the patient's physical condition as to how many I would extract. If he were weak and sickly, with a bad history, I would extract only one at a sitting. A man came into my office with two loose teeth and I extracted them. I thought that was too many, but I did it. That was at eleven in the morning. He was to come back. He came back, but he was chilling, so that his teeth were chattering, and he could not sit still in the chair. I went with him to the hotel, a block from the office, wrapped him in hot blankets, ordered hot lemonade and hot water bottles, and he continued to chill so that he vibrated the bed on which he lay until four o'clock the next day. Then he stopped chilling, and the next morning he got up feeling very weary. The only effect remaining the next day of the bacterial invasion which I caused by removing those teeth, was that he was tired. It is always wiser to do too little than too much. During my last trip in the Southwest, I had ten cases cited where patients had died from too rapid extraction. It is best not to extract too many teeth at one sitting, for people who are sick. If a patient is sturdy and healthy and wants them all out, I take them all out at once. But you had better err on the side of safety. I have gone to the extreme of employing a technician to make blood and urine analysis for all cases that exhibit evidence of secondary infection. I take the case history as carefully as any good physician, and in addition I make a careful mouth examination which they do not. If the net result of those examinations makes me feel that the patient is a low risk, I handle him with a great deal of discretion. If, on the other hand, he impresses me as full of vigor and able to take an enormous shower of micro-organisms, I go further.

QUESTION: Why don't teeth decay in some pyorrhea cases?

DR. HARTZELL: Some of them do decay. I can not answer that question. I wish I could. I do not know. I do not know anybody who does know. But I do believe it is because of the low vitality of the growth.

QUESTION: Will pressing from tooth toward gum cause recession?

DR. HARTZELL: No. Recession of the gums cannot occur unless the bone be first destroyed. The gum has a normal depth. Squeezing it occasionally doesn't cause the gum to recede. But if there is an acute infection and inflammation breaking down the bone, the gum will be swollen, and when you cut off the bacterial invasion, that swelling will recede, but the gum will not recede any further than the bone which is left will permit; so you cannot possibly injure the gum by gently squeezing it.

QUESTION: What do you do with sensitive teeth in treating them?

DR. HARTZELL: I paint sensitive teeth and rub into them silver nitrate, if they are in positions where I can do that without grossly offending the patient's sensibilities. Otherwise, I use tin oxid, and I have had my attention drawn to the fact that the tooth powder which is called "Revelation," if constantly used, tends to desensitize teeth. And Rhein, of New York, makes a tooth powder that will desensitize teeth. The great objection to Pepsodent is said to be that it makes sensitive teeth more sensitive.

QUESTION: How much destruction of bone and detachment of the peridental membrane are necessary to indicate extraction?

DR. HARTZELL: I used to think that if the teeth had lost one-half the original alveolar process, they probably had better be extracted, but in the last four or five years, since I have been following this system of prophylaxis, I find that you can maintain teeth in useful masticatory power with only one-third normal attachment, or even less. You will have to settle that for yourselves. It depends on the care the patient gives and the cleanliness he maintains and upon the occlusion.

Teeth in malocclusion that cannot be corrected should be extracted.

IMPORTANT

OHIO STATE DENTAL SOCIETY

Please note and remember that the next meeting of the OHIO STATE DENTAL SOCIETY will convene one week earlier than usual, viz., Nov. 30, Dec. 1st and 2nd., 1920, Memorial Hall, Columbus.

Watch the October and November "SUMMARY" for information concerning the program.

F. R. Chapman, Sec'y.

FUNDAMENTALS OF OPERATIVE DENTISTRY*

BY W. H. O. MCGEHEE, M.D., D.D.S., CLEVELAND, OHIO

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PREPARATION OF CAVITIES

BY "PREPARATION OF CAVITIES" is meant those procedures incident to the removal of decay and the shaping of cavities, so that when filled, the teeth shall be restored, as far as possible, to their original form and strength, and be immune from future decay in the same location.

Before the student begins the study of cavity preparation it is first necessary that he have a fair knowledge of the various causes leading to the production of cavities in teeth requiring the filling operation, as well as a good comprehension of the pathology of this morbid condition which is designated by the term dental caries. Owing to the fact that matters of this nature should be confined to text books on dental pathology, no attempt will be made in this work to enter into an extended discussion of them.

Briefly, however, it may be said that the factors concerned in the production of the condition may be divided into (a) *exciting*, and (b) *predisposing*, as well as into (c) *local*, and (d) *systemic*. If the predisposing and systemic causes be largely absent, the exciting causes may be to quite a degree held in abeyance through intelligent, systematic and regular local hygienic means.

The carious process may be divided into two characteristic phases, viz.:

First, Penetrative Fermentation, viz., a dissolution of the inorganic salts of the enamel and dentin through the action of lactic and other organic acids, which result from the fermentation of carbohydrates by the oral micro-organisms.

Second, Disintegrative Putrefaction, viz., a destruction of the organic colloidal material, the proteins, through the action of putrefactive bacteria. The changes incident to this putrefactive process are the same as those occurring in the putrefaction of all albuminous substances (which contain the elements C, H, O, N and S in their molecule), resulting in the ultimate formation of such end products as CO_2, NH_3, H_2S, H_2O, $HC_2H_3O_2$ and other chemical combinations.

(*Continued from page 710, AUGUST SUMMARY).

The following tabulation may be considered a rational exposition of the, at present known, causes of dental caries, viz.:

TABLE SHOWING FACTORS CONCERNED IN TOOTH DECAY

A *Local Factors*

First, formation of bacterial plaques on the teeth.

Second, fermentation of carbohydrates (starches and sugars), producing lactic and other organic acids.

Third, accumulation and putrefaction of proteids, affording a nidus for the localization of fermentable material and harmful bacteria.

Fourth, increased deposition of mucin in the mouth, resulting in acceleration of plaque formation.

Fifth, excessive excretion of glycogen (fermentable) in the saliva, as a result of (a) faulty metabolism by the liver of carbohydrate foods, or of (b) irritation of the pituitary body by reflex action from pathological dentition and similar causes.

Sixth, diminution in the amount and alkalinity of the saliva, the natural cleansing and acid-neutralizing agent.

Seventh, irregularities of the teeth.

Eighth, abnormal interproximal spaces and improper contact points (natural or artificial).

Ninth, defective tooth structure from (a) faulty union of enamel plates; (b) imperfect deposition of calcium during the formative periods; (c) cracks in or fractures of the enamel; (d) hypoplasia of the enamel and dentin, and similar conditions.

Tenth, recession of the gums, exposing unprotected dentinal surfaces at the necks of the teeth.

Eleventh, improper habits of mastication.

B *Systemic Factors*

First, improper dietary: (a) excessive carbohydrate diet, accelerating glycogen formation, which finally reaches the saliva; (b) excessive consumption of sugars, stimulating the increased deposition of mucin in the saliva; (c) improper nourishment of infants, (bottle fed), resulting in improper metabolism of calcium salts with resulting poor tooth-and-bone formation; (d) lack of lime-containing articles of food; (e) insufficient water in the dietary, resulting in diminished salivary flow.

Second, the sedentary life, resulting in lowered bodily vigor, anemia, leukæmia, digestive disturbances, malnutrition, faulty metabolism, acidosis, nervous exhaustion and similar disorders, with consequent lessening of the vital resistance of the entire body, including the teeth.

Third, lowered bodily vigor, from any cause, including inheritance and disease processes of any character, resulting in the production of poor tooth development during the formative stages, or of retrograde metamorphosis in the same organs during the later periods of life.

Fourth, affections of the ductless glands, resulting in (a) increased deposition of glycogen in the blood and saliva; (b) interference with calcium metabolism in the tissues of the body, including the teeth; (c) as well as other imperfectly-understood pathological changes.

A careful survey of this table will reveal certain important considerations, viz.:

First, that the active exciting causes of caries are to quite a degree the result of the failure on the part of the patient to appreciate the importance of the regular application of the ordinary laws of hygiene to the oral cavity.

Second, that many of the local factors are, however, not concerned with conditions of a purely local nature, *per se,* but are dependent on certain faults in the dietary.

Third, that three of the remaining local factors, viz.: Irregularities of the teeth, abnormal interproximal spaces and recession of the gums are largely preventable or remediable.

Fourth, that the single remaining local factor, viz.: Defective tooth structure, is the only one mentioned which is not directly under the control of the dentist.

There is no phase of dentistry which is of greater importance to the general practitioner than that of cavity preparation. Inasmuch as the daily work of the average dentist is largely concerned in the adaptation into prepared cavities of filling materials for the restoration of lost tooth structure, it might almost be considered the keynote to successful dental practice of today. If the cavity be improperly prepared, if the foundation be formed along incorrect lines, the superstructure—the filling material—will be placed on insecure ground and will easily succumb to the stresses later to be brought to bear upon it.

The technic of the preparation of cavities was a number of years ago placed on a definite scientific basis by the lamented Dr. G. V. Black and his co-workers. The theories incident to "extension for prevention," the correct bevelling of enamel margins and the adoption of the "box" form in the preparation of the internal parts of cavities, are now accepted practice among the great majority of modern operators who read and keep abreast of the trend of thought and development of the twentieth century. "Black" cavity preparation is officially recognized and advocated by the American Institute of Dental Teachers, is taught in most of the recognized dental colleges of this country, and is the only method described in any modern text book of operative dentistry published in the United States, including the works of G. V. Black, The American Text Book of Operative Dentistry, Marshall's

Operative Dentistry, Davis' Essentials of Operative Dentistry and my own book on Operative Technics, previously published.

If one will avail himself of the opportunity to consult any of these works, he will at once discover that the cavity-forms therein advocated do not admit of the formation of a groove on the gingival wall of proximal cavities, thereby interfering with the source of nourishment *via* the dentinal tubules, to that portion of the tooth lying mesially or distally to the groove, as well as mechanically weakening that area. He will likewise perceive that in none of these authorities is there advocated the obsolete practice of weakening labial, buccal or lingual walls by the placing of grooves in those areas for the retention of fillings. He will also find it to his own interest, as well as to that of his patients, to note that the proper extension of the marginal outline into immune areas is not the extremely radical procedure he may have imagined it to be.

Before taking up a discussion of the technical procedures incident to the preparation of cavities it is first necessary to acquire a nomenclature. By nomenclature is meant a system of sounds, words, or signs, by which individuals of the same race, profession or calling are enabled to understand each other. The profession of dentistry has a nomenclature of its own, which consists of numerous technical names, terms or phrases used in that science. A knowledge of the nomenclature or terminology of cavity preparation is essential.

For the reader to understand many of the terms to be mentioned in a study of the nomenclature of the subject, it is necessary for him to realize in the beginning that all cavities are given a box or mortise shape, or some modification of this form, the inner walls of the box being plane surfaces joining each other to form definite line and point angles, as will be seen on examination of the mortise forms shown in *Figs. 91 to 96 inclusive.*

NOMENCLATURE OF CAVITY PREPARATION

179. Define the term *Angle*.

The union of two surfaces along a definite line (*Line angle*), or of three surfaces at a point (*Point angle*).

180. Define *Cavo-Surface Angle*.

The angle formed by the juncture of the walls of the cavity with the surface of the tooth.

181. Define *Axial Line Angle*.

A line angle running parallel with the long axis of the tooth.

182. Define *Pulpal Line Angle*.

One running horizontally to the long axis of the tooth.

183. Define *Wall*.

One of the internal boundaries of a cavity.

184. Define *Margin*.

The junction of the walls of a cavity with the surface of a tooth.

185. Define *Marginal Outline.*
The shape of the cavity along its margins.

186. Define *Dento-enamel Junction.*
The line representing the junction of the enamel and dentin.

187. Define *Enamel Wall.*
That part of the wall of a cavity composed of enamel.

188. Define *Dentin Wall.*
That part of the cavity wall consisting of dentin.

189. Define *Seat.*
In simple cavities the bottom or floor of the cavity, either the axial or pulpal wall; in proximo-incisal and proximo-occlusal cavities, the gingival wall.

190. Definite *Step.*
The auxiliary portion of the compound mortise form, consisting of the axial and pulpal walls in complex cavities.

191. How are *Cavities Named?*
Cavities in the teeth take the names of the surfaces in which they occur.

192. How may *Cavities be Grouped* from the standpoint of their *situation?*

A Simple Cavities: Labial, buccal, lingual, mesial, distal, occlusal.

B Complex Cavities: Mesio-incisal, disto-incisal, mesio-labial, disto-labial, mesio-lingual, disto-lingual, mesio-occlusal, disto-occlusal, linguo-occlusal, bucco-occlusal, mesio-disto-occlusal, mesio-disto-incisal.

193. What is meant by a *Proximal Cavity?*
A mesial or distal cavity.

914. What is an *"M. O. D." Cavity?*
A Phrase used by some to express a Mesio-disto-occlusal cavity.

195. What is an *"M. I. D." Cavity?*
Mesio-disto-incisal.

196. Give a *Classification of Cavities* from a standpoint of *similarity* of *treatment.*

First, Pit and Fissure Cavities.

A Cavities in the occlusal surfaces of bicuspids and molars; 1A cavities.

B Cavities in the occlusal two-thirds of buccal and lingual surfaces of molars; 1A cavities.

C Cavities in the lingual surfaces of upper incisors; 1A cavities.

Second, Smooth Surface Cavities.

D Cavities in the proximal surfaces of bicuspids and molars; 3B cavities.

E Cavities in the proximal surfaces of incisors and cuspids not involving the incisal angle; 2A cavities.

F Cavities in the proximal surfaces of incisors and cuspids which do involve the angle; 2B cavities.

G Cavities in the gingival third of labial, buccal and lingual surfaces; 1B cavities.

197. How are *Cavity Walls Named?*

Cavity walls take the names of the surfaces on which they are placed, such as labial, buccal, incisal, occlusal, lingual, mesial, distal.

198. Name the *Walls in Occlusal Cavities.*

Mesial, distal, buccal, lingual, pulpal.

199. Name the *Walls in Buccal and Lingual Cavities.*

Mesial, distal, occlusal, gingival, axial.

200. Name the *Walls in Proximal Cavities in Anterior Teeth.*

Labial, lingual, gingival, axial.

201. Name the *Walls in Simple Proximal Cavities in Posterior Teeth.*

Buccal, lingual, occlusal, gingival, axial.

202. Name the *Walls in Proximo-incisal Cavities.*

First, In the proximal portion: labial, lingual, gingival, axial.

Second, in the step portion: labial, lingual, mesial (or distal) pupal.

203. Name the *Walls in Proximo-occlusal Cavities.*

First, in the proximal portion: gingival, buccal, lingual, axial.

Second, in the occlusal portion: mesial (or distal), buccal, lingual, pupal.

204. Distinguish between the *Axial and Pupal Walls.*

The axial wall is that wall lying nearest the pulp in cavities occurring on axial surfaces, while the pulpal wall overlies the pulp in occlusal cavities, being the floor of these cavities, and runs horizontally to the axial surfaces. Complex cavities have both an axial and a pulpal wall.

205. What is meant by *Sub-Pupal Wall?*

When the pulp is removed, the pulpal wall disappears and the floor of the pulp chamber becomes the sub-pulpal wall.

206. When the *Axial Wall is Removed,* what name is given that wall of the cavity resulting?

It takes the name of the wall of the pulp chamber; either mesial or distal.

207. How are *Angles Named?*

They take their names from the surfaces or walls forming them. Cavities when properly prepared are of a typical box or mortise shape, all the walls of which unite at definite line and point angles.

208. Name the *Angles in an Occlusal Cavity.*

First, Line Angles: mesio-buccal, mesio-lingual, disto-buccal, disto-lingual; bucco-pulpal, linguo-pulpal, mesio-pulpal, disto-pulpal.

Second, Point Angles: mesio-bucco-pulpal, disto-bucco-pulpal, mesio-linguo-pulpal, disto-linguo-pulpal.

209. Name the *Angles in Buccal or Lingual Cavities* in bicuspids and molars.

First, Eight Line Angles, as follows: Mesio-gingival, disto-gingival, mesio-occlusal, disto-occlusal, axio-gingival, axio-mesial, axio-occlusal, axio-distal.

Second, Four Point Angles, as follows: Axio-mesio-gingival, axio-mesio-occlusal, axio-disto-occlusal, axio-disto-gingival.

210. Name the *Angles in Proximo-occlusal Cavities.*

Eleven line angles and six point angles, as follows:

First, in the mesial or distal portion, five line angles and two point angles, viz.:

A Line angles, bucco-gingival, linguo gingival, bucco-axial, linguo-axial, gingivo-axial.

B Point angles, gingivo-bucco-axial, gingivo-linguo-axial.

Second, in the step portion, five line angles and two point angles, viz.:

C Line angles, bucco-distal (or mesial), linguo-distal (or mesial), disto- (or mesio-) pulpal, linguo-pulpal, bucco-pulpal.

D Point angles, disto- (or mesio-) bucco-pulpal, disto- (or mesio) linguo-pulpal.

Third, also an axio-pulpal line angle, and pulpo-linguo-axial and pulpo-bucco-axial point angles.

211. Name the *Angles in Mesial and Distal Cavities in Incisors and Cuspids.*

First, Six Line Angles, as follows: Labio-gingival, linguo-gingival, incisal, axio labial, axio-lingual, axio-gingival.

Second, Three Point Angles, as follows: Axio-labio-gingival, axio-linguo-gingival, axio-incisal.

212. Name the *Angles in Proximo-incisal Cavities.*

The same angles as mentioned in the preceding answer except the incisal and axio incisal, which are missing; also in addition the *Step* will present the following, viz.:

First, Six Line Angles, viz., mesio- (or disto) labial, mesio- (or disto) lingual, pulpo-distal (or mesial), pulpo-lingual, pulpo-labial, pulpo-axial.

Second, Two Point Angles, viz., mesio- (or disto) pulpo-labial and mesio- (or disto) pulpo-lingual.

213. How may *Cavities be Divided for Purposes of Description?*

They may be divided into thirds as teeth are divided, viz., in either the horizontal, mesio-distal, or bucco-lingual plane.

214. Name the *Steps in Cavity Preparation.*

First, establish the outline form.
Second, remove the decay.
Third, give the cavity proper form:
  A Convenience form.
  B Resistance form.
  C Retention form.
Fourth, bevel and polish the enamel margins.
Fifth, perform the toilet of the cavity.

ESTABLISHING THE OUTLINE FORM

215. What is meant by *Establishing the Outline Form?*

Carrying the marginal outline to the position it will occupy on the completion of the cavity.

216. Give *Seven Rules for Establishing the Outline Form.*

Rule 1. Extend the margins until solid tooth structure, free from decay, is reached.

Rule 2. Leave no overhanging enamel margins unsupported by dentin. The enamel of the tooth is extremely brittle, owing to its histological structure, and depends for its strength on the support which it receives from the underlying dentin.

Rule 3. In fissure cavities, extend the margins to include all the fissures and angular grooves. Pits and fissures are extremely liable to decay, and if this rule is not followed, decay is likely to occur in that part of the fissure not included in the cavity, with a consequent undermining of the filling.

Rule 4. Extend the margins of cavities approaching closely to deep developmental grooves, to include the grooves for reasons of strength, as well as for the reason given in Rule 3.

Rule 5. Unite two cavities approaching closely to each other, to prevent leaving a weak ridge of tooth structure between them.

Rule 6. Extend the gingival margins of cavities occurring in the gingival third of labial, buccal and lingual surfaces under the free margin of the gum, where they will be less liable to decay.

Rule 7. In proximal cavities extend the labial, buccal and lingual walls well out into the embrasure, into areas where they will be less likely to decay; the incisal or occlusal margins beyond the contact point; and the gingival margins under the free margins of the gum. The extension of these margins, as laid down in this rule, follows the law known as "extension for prevention" or "cutting for immunity."

217. What *Parts* of the teeth are *most likely to decay,* and why?

Those portions at which food accumulates more readily and is less easily removed; such as pits and fissures, proximal surfaces, and the gingival third of labial and buccal surfaces; because these locations are more difficult to reach with the brush.

218. At what part of the *Proximal Surface* does *Decay* usually begin?

At a point slightly gingival to the contact point, consequently cavity margins should, as a rule, be extended beyond this locality and include the contact point.

219. What *Parts* of buccal and labial surfaces are *Least Liable to Decay?*

At or near the mesial and distal angles; hence it is well to extend the margins of cavities on these surfaces, as well as those of proximal cavities, to these locations.

EXTENSION FOR PREVENTION OR CUTTING FOR IMMUNITY

Proximal surfaces of the teeth are much more subject to decay than other portions, because food and germs accumulate more readily here, and are less easily removed. This being the case, if the margins of cavities are left in these *vulnerable areas*, they will be much harder to keep clean, and hence decay is likely to recur readily. Recognizing this fact, it is the accepted practice to extend the margins of cavities, when they occur in these areas, by cutting away enough of the tooth substance to carry them out to locations where the food is not so liable to deposit, and where they may be more readily cleansed. The food does not accumulate under the gum margin so much as it does a short distance occlusally to this point, hence the reason for extension of the gingival margins. Food accumulates very readily and frequently remains just gingivally to the contact points of two approximating teeth, and in order to obviate the necessity of leaving the incisal or occlusal margins within this vulnerable area, these margins usually are carried beyond this point down toward the incisal, or occlusal surface, where they can be more readily cleansed. Buccal and lingual margins, for the same reasons, are extended out into the embrasures for a certain distance, depending on the convexity of the tooth surface and the character of approximation. In gingival third cavities, the gingival margins are also carried under the gum, and the mesial and distal margins are extended nearly to, but not beyond the angles, for the reason already given.

Owing to the conditions under which operations are performed in the mouth, it is not always possible or advisable to extend cavity margins as described under the law of extension for prevention. The conditions which may modify this operation are the following:

First, a family history of lack of susceptibility to caries.

Second, a personal history of similar non-susceptibility.

Third, presence of a period of immunity.

Fourth, lowered vitality from sickness, convalescence, pregnancy, adolescence and similar causes.

Fifth, personal habits of cleanliness.

Sixth, lack of will power and low mentality.

Seventh, perfect habits of mastication.

Eighth, abundance of food in the dietary requiring adequate mastication.

Ninth, normal, freely-flowing salivary secretion, nature's flushing agent.

Tenth, regularly-aligned arches.

Eleventh, youth and old age, these conditions frequently not admitting of extensive operations.

Cavity margins may frequently be placed in immune areas by separating the teeth and building fillings out to full contour, thus drawing labial, buccal and lingual margins away from each other. This procedure often obviates the necessity for extensive cutting of tooth structure.

The *Typical Outline Form* in the various types of cavities may be described as follows:

First, in the occlusal surface of *upper bicuspids* extend the full length of the occlusal groove. (*Fig. 90a*).

Second, in the occlusal surface of the *lower first bicuspids,* owing to the presence of a strong transverse ridge, a cavity occurring in the mesial of distal pit is usually confined to the pit and not carried across the ridge. (*Fig. 90b*). In lower second bicuspids the form will be crescentic or triangular, depending on the shape of the occlusal groove. (*Fig. 90c*).

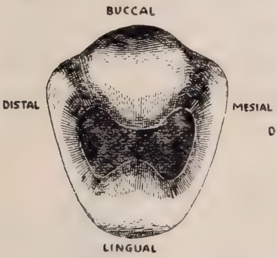

Fig. 90a

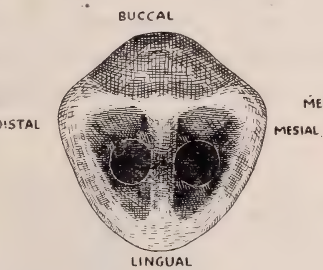

Fig. 90b

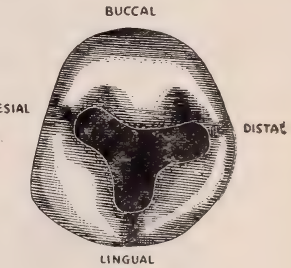

Fig. 90c

Fig. 90a—Outline form for a cavity on the occlusal surface of an upper first or second bicuspid, extends full length of the occlusal groove.

Fig. 90b—Outline form on lower first bicuspid. Confine the cavity to the mesial and distal pits.

Fig. 90c—Outline form on occlusal surface of some lower second bicuspids. In others the form will be crescentic in shape.

Third, in the occlusal surface of *upper molars;* in the central fossa include as much of the buccal and mesial grooves as is necessary to establish good finishing margins. (*Fig. 90d*). In the distal fossa the cavity is usually oblong in shape and may sometimes be confined to the occlusal surface; in many instances, however, the lingual groove is deeply fissured, and it is then necessary to extend full length of this groove and on to the lingual surface. (*Fig. 90d*). If cavities involve both the central and distal fossæ and approach each other very closely, the oblique ridge should be removed and the cavities united. (*Fig. 90e*). The best mode of deciding as to the advisability of uniting the two cavities is to prepare them separately, when the judgment of the operator will then dictate for or against the uniting of the cavities. In three-cusped third molars there will be no distal fossa, consequently the typical shaped cavity will involve the central fossa, with just enough of the mesial, buccal and distal grooves to obtain good finishing margins, the resultant form being more or less triangular in shape. (*Fig. 90f*).

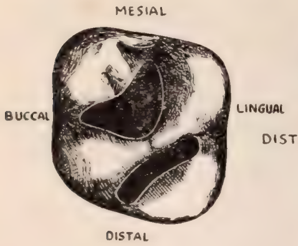

Fig. 90d

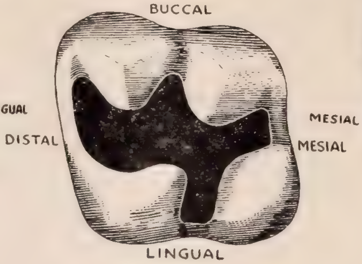

Fig. 90e

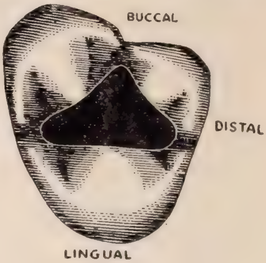

Fig. 90f

Fig. 90d—Outline form in the central and distal fossæ of upper molars.

Fig. 90e—Outline form on occlusal surface of upper molars where the central and distal fossæ are both involved.

Fig. 90f—Outline form on occlusal surface of upper third molars where the disto-lingual cusp is absent.

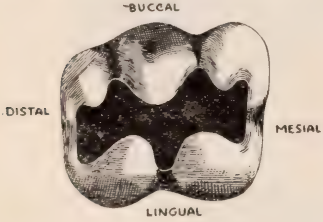

Fig. 90g

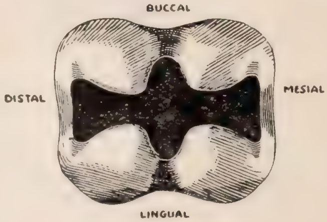

Fig. 90h

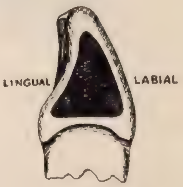

Fig. 90i

Fig. 90g—Typical outline form on occlusal surface of lower first molars.

Fig. 90h—Outline form on occlusal surface of lower second molars.

Fig. 90i—Outline form in simple approximal cavities on the anterior teeth.

Fourth, in the occlusal surface of *lower first molars* the cavity will include a portion of the five grooves found on that surface, viz., buccal, disto-buccal, mesial, distal and lingual, (*Fig. 90g*); while in the *lower second molar* the resultant form will be crucial in shape. (*Fig. 90h*). The form in the *lower third molar* will resemble that described for the first or second molars, depending on the form of the tooth.

Fifth, a cavity in the *proximal surface of the anterior teeth*, upper or lower, will present a triangular form, with a straight gingival margin joining the labial and lingual margins at rounded corners, while the two latter margins converge to complete the third corner of the triangular form. (*Fig. 90i*).

The *Technic* for obtaining outline form is herewith given:

First, Pit and Fissure Cavities. If small, open and extend full length of the fissure with a dentate fissure bur. In using, extend the point of the bur under the enamel and cut from within, outward. Small pits may frequently be better opened at the beginning with the round bur. If necessary to extend the margins much, an inverted cone bur will first undermine the underlying dentin, when the enamel may then be readily removed with the straight or bin-angle chisel by means of hand pressure or the mallet. In large cavities of this class, first chisel away overhanging enamel margins, then use the inverted cone bur for extension into solid dentin, after which use the chisel again for removal of any further enamel.

Second, Smooth Surface Cavities. First break down all unsupported enamel with the chisel, cutting in the direction of the length of the enamel rods. Avoid shock by refraining from cutting too large amounts at each thrust or blow. Then, if necessary to extend margins further, first undermine the underlying dentin with the inverted cone bur, when the enamel may then be readily removed by means of the straight or bin-angle chisel, Black's side-cutting instruments or gingival margin trimmers, depending on the location. Hatchet and hoe excavators are also of value for cutting enamel and dentin.

(CONTINUED)

THE TREATMENT OF ROOT CANALS BY A SILVER REDUCTION METHOD*

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THE NEED for root canal treatment is the outcome of caries. For this reason I shall speak first of the bacteriology of caries, its character, and its penetration into the tooth substance. In addition, I shall refer to the efficacy of our present methods of treating the caries action. The classic work of Miller is familiar to all. His work was done when the subject of fermentation, particularly of wines and liquors, occupied the attention of many laboratory students. Miller applied this idea to dental caries and he showed by zinc crystallization that lactic acid was formed by the fermentation of bread with saliva. He regarded caries as due to a mixed infection. Goadby worked and studied it from a more modern standpoint. From deep caries he isolated two micro-organisms B. necro-dentalis and streptococcus.

At the Forsyth Dental Infirmary for Children, I undertook a study of the subject which comprised a larger number of cases than were ever studied. I chose the twelfth and sixth years molars. Here the carious process is most active. Modern bacteriological methods were used. We succeeded in isolating from all caries some members of Moro-Tissier group of micro-organisms. This highly aciduric flora at least possesses the property of inaugurating decay and in a higher degree than other micro-organisms. I believe that Goadby's necro-dentalis belongs to this group. I cannot give an adequate description of these micro-organisms here, but will show a few slides of them. This group is, as I have said, highly aciduric. Some members of the group are highly pleomorphic. It is a known group and has been studied by others in the feces of the nursling, constituting its normal intestinal flora.

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*Read before the North Carolina State Society, 1919.

Bacillus X is somewhat pleomorphic. It is Gram-positive on agar. It most frequently appears as a long chain of short, thick rods, 5×0.5 microns, the chains often showing parallelism. Under certain conditions the individuals are considerably longer and do not occur in chains. Moreover, smears of the organism often show only masses of long, tangled, unbroken threads, occasionally having one long, thickened end. On glucose-agar many of the individuals fail to retain the Gram stain. It is an anærobe facultatively ærobic. It produces a high degree of acidity, often requiring 14 cc. of N/NaOH to neutralize 100 cc. of the bouillon. It ferments glucose, saccharose, and levulose, but does not ferment lactose readily. It coagulates milk and does not form indol or ammonia. On Petri dishes its colonies are transparent, round, entire, slightly raised.

Bacillus acidophilus of Moro, as found in dental caries, is a non-mottle, nonpathogenic rod. When grown on agar it is short and thick and measures 0.75×2 to 3 microns. It is Gram-positive. On glucose-agar the rods are longer and thinner and more distinctively arranged in groups with the individuals showing parallelism. They produce turbidity of the media. They are Gram-negative. On blood serum the rods measure 0.1×1 micron. They are Gram-negative, grouped as in glucose-agar.

Bacillus acidophilus grows best anærobically when first isolated by means of acid broth. In milk it clots the lower portion first. In peptone water it produces no indol or ammonia. In broth if forms a heavy sediment with some turbidity. It forms no gas in sugar. It is a facultative anærobe and should be transplanted every ten days. It is a high acid former.

According to these studies it is not as pleomorphic as has been supposed.

The colonies are slightly raised, round, smooth, opaque and white.

B. bifidus, as it appears in the carious tooth, is to be found in many forms. It is found frequently in its bifurcating state, with tapering or thickened ends, in V and Y forms, in streptococcal forms, as masses of Gram-negative cocci, as straight rods, in crosses, and as a sporeformer. It is Gram-positive in young cultures. It grows ærobically and anærobically, although according to Kendall it is a strict anærobe. Noguchi shows it to have both anærobic and ærobic phases. In contradistinction to this, the bifurcating form of our organism grows well ærobically after adaptation to artificial media. The colony is raised, white, entire, butyrous.

This brief description of the micro-organisms is made of excerpts from articles descriptive of this work.

In preparing many ground tooth sections in this study of caries, I was struck with the depth of penetration of caries. A flatly ground slide does not always show this but in many apparently superficial carious spots it is evident that the decay extends nearly if not quite to the pulp.

A bacteriological examination of many nicely prepared cavities shows that they are not sterile. This fact, together with the foregoing statement, shows that it is not practicable to attempt to sterilize a cavity with a bur. If we are to proceed upon surgical principles, then we must sterilize our cavities. If we wish to do as much as we can to avoid pulp complication and still to proceed upon surgical in contradistinction to mechanical ideas, then we should excavate as little as possible consistent with retention and *sterilize our cavities.*

The method that I am about to describe to you will effect this sterilization; it will do more: it will impregnate all affected dental structure with finely-divided metallic silver; it will not enter sound dentin. It is intended as a preventive measure. It will absolutely kill the carious process and it protects against a secondary attack. I believe that it should be applied to children's teeth as a routine matter. It will enter any defect in structure, destroy the bacterial flora, and block the tubuli with finely-divided silver. It will not enter, nor stain sound structure.

In a simple cavity make a good edge; clean out the loose debris and wash out with alcohol to get rid of fatty substances; then apply this material. This will fill the disorganized dentin in an infinitely more perfect manner than is otherwise possible. Fill the bulk of the cavity with anything you desire. You have avoided to the fullest possible extent encroachment toward the pulp. What I want to especially emphasize at this point is the value of this method as a preventive measure. If children's teeth were treated with this material thoroughly, beginning with the very young, and if it were periodically followed up, I believe caries would be entirely forestalled or obliterated. The mechanical using up of tooth structure is largely done away with. Before I go on to describe the principles to be observed in the treatment of any root-canal work, and before I describe the technic of application in various other dental conditions, let me tell you how to prepare the material and something of the chemical action.

Prepare two solutions as follows:

Solution A—Three grams of silver nitrate crystals, dissolve in 1 cc. of water. When dissolved, cool a little and add 2.5 cc. of 28 per cent. ammonia.

This will give a murky solution. It should have no odor of ammonia. Allow it to settle; the clear top solution should be used. Keep in a dark glass bottle; then prepare,

Solution B—Which consists of a twenty-five per cent. solution of formalin, and keep this in a separate bottle.

If some of solution A is poured into a test-tube, or small glass vial and solution B is added, a heavy precipitate of metallic silver occurs, making a mirror upon the sides of the receptacle. The chemical reaction that occurs is one of reduction. Many substances will reduce the silver from this solution, but we believe formalin to be the best for our purpose. I have written an account of this method which has appeared elsewhere, and because there is much to be said upon the technical side of the question I shall here confine myself to that part of the treatment.

We are dealing with a powerful antiseptic. There is no question as to its ability to produce sterility. This we have demonstrated by many careful tests. Any one who does not get sterility has not mastered the technic, or does not carry out his tests with the exactions demanded in such work. It is, then, to be remembered that any antiseptic will destroy living tissue before it will destroy bacteria, and it is better to confine this solution to the tooth proper. If it goes through a root-end it will cause pain, if the tissue about the root-end is intact. We may use it within the tooth substance and under certain circumstances we may use it outside the tooth-root. We must always hold in mind the distinction between dentin and cellular tissue. The proper antiseptics to use in the soft tissues are Dakin's solution, Eusol, Physiological Salt, or drainage. These solutions mentioned are somewhat antiseptic. They are solvent of mucin, pus and other detritus, and eusol has a different osmotic pressure than the blood causing an exudation of the serum, which is, of course, the best of antiseptics. These preparations, then, clean the tissue and induce the destruction of bacteria in the natural way, promoting healing. They do not injure healthy tissues. There are a number of preparations on the market that are based on these principles, but for convenience I will give here the method of preparing these solutions. Dakin's solution is prepared as follows:

20 gms. lime chlorinated; 1 liter water; let this stand six to twelve hours, shaking from time to time; filter—estimate the chlorin in solution as follows:

To 10 cc. of filtrate add 20 cc. of a ten per cent. solution iodid of potassium and 2 cc. of glacial acetic acid or strong HCL.

Titrate against N/10 sodium thiosulphate decolorization marks the end point.

Number of cc. of thiosulphate of soda required × 1.775 = per cent. of chlorin in 100 gms. of the chlorinated lime used. Carry on work from Daufresne's table.

E.g. Thus if 14 cc. of N/10 thiosulphate is required 14×1.775 = 24.85.

Twenty-five titer of cal. chlorid sample means chlorinated lime 184 gms. must be used for 10 liters; dry soda carb. 93 gms.; bicarb. 72 gms.

Place chlorinated lime into one bottle and sodium carb. and bicarb. into another. Let stand six to twelve hours, shaking from time to time. Mix, let stand half hour and filter through double paper—test for strength. N/10 sodium thiosulphate consists of 25 gms. to liter.

Eusol is prepared by adding 25 grams of equal parts by weight of chlorinated lime and Boric acid to a liter of water. Dichloramine-T paste is made as follows:

Stearic acid, 16 gms; water, 200 cc.; chlorazene, 4.6 grains.

Enough sodium hydroxid is added to completely saponify the acid. Dichloramine-T is an attempt to render Dakin's solution more stable. We have used it in root canals with enlarged foramina with nothing but good results. Dichloramine-T has been used in bone infection.

DAUFRESNE'S TABLE

Titer Chlorinated Lime	Chlorinated Lime	Dry Carb. of Soda	Bicarb. Soda
20	230 Gms.	115 Gms.	96 Gms.
21	220 "	110 "	92 "
22	210 "	105 "	88 "
23	200 "	100 "	84 "
24	192 "	96 "	80 "
25	184 "	92 "	76 "
26	177 "	89 "	72 "
27	170 "	85 "	70 "
28	164 "	82 "	68 "
29	159 "	80 "	66 "
30	154 "	77 "	64 "
31	148 "	74 "	62 "
32	144 "	72 "	60 "
33	140 "	70 "	59 "
34	135 "	68 "	57 "
35	132 "	66 "	55 "
36	128 "	64 "	53 "
37	124 "	62 "	52 "

(Based on 10 liters and to contain .45—.5 per cent. Chlorin).

Now in the treatment of deep caries we are approaching the pulp, and this is cellular tissue. This silver preparation would injure it, therefore, I recommend mixing a paste of zinc oxid and eugenol, adding to it a crystal or so of silver nitrate, and smearing this over the bottom of deep cavities. This will become quite hard. Follow by applying, first, a drop of solution A, followed with a drop of solution B; repeat about three times in order to reduce a considerable amount of silver. Dry the cavity and fill with any material you like. The cavity is sterile and the fine anatomy of the tooth is filled with finely divided silver.

An application of the zinc oxid-eugenol-silver-nitrate paste may be put directly over an exposed pulp. I never have known one to ache when this was done.

Before I describe its application in root-canal work, I want to show you some slides showing that whenever a pulp or the peridentum is inflamed for any length of time a structural change occurs in the tooth substance. The dentinal tubuli disappear and the structure becomes hyaline. This hyaline condition completed is impervious to the most penetrating stains. It is sealed by nature. It occurs in chronic abscesses, and while, undoubtedly it is a degenerative condition, it is at the same time a protective one. A modified form of this is seen in the protection nature tries to establish before the inroads of caries. Previous to the completion of this process the tooth undergoes a disintegrating condition, where the tubuli stain deeply, and are also full of infection. This treatment kills the bacterial life and fills these tubuli with metallic silver. We have something besides the canal to consider, then, in root treatment; we have the tooth substance itself to treat.

In the case of a dead pulp, apply the material freely before entering the canal with the instruments. If the putrescent pulp is left intact the material will follow along its entire length, no matter how fine or how crooked the canal, and it will render the pulp stiff, dry, and sterile. The material will stop short at the point where the tissue is living. This pulp never need be removed, but I should remove it and treat again with the silver, being careful not to work it through the end of the root. The treatment has rendered the canal sterile and impregnated the diseased dentinal structure with metallic silver. The bulk of the canal may be filled with anything. It does not matter. The anatomy and the apices of the tooth are already filled.

The sterilization of any pulp canal is effected in the same way. I depend largely on capillary attraction for conducting the material to its proper place. If you will take a laboratory tooth and open the pulp chamber and flood it, you will see that the silver comes out at apices of the root, no matter how fine the canal.

Reports have come to me of severe after-pain. This is due to faulty technic and to disregard of the principles upon which antiseptics are to be used. Pain means that the material has been forced through the apex, and it means nothing else. Place a broach into the canal, apply a drop of the silver solution; let it run along the broach, lightly lift the broach and lower it. The material will go to the very end. Then apply in the same manner the formalin. The silver reduction immediately occurs. Repeat three times; then dry, apply solution A, alone; follow with eugenol, dry and fill. This last application removes any possibility of formalin excess. Such men as are accustomed to handling formalin will have no trouble. Formalin is a most excellent root-canal antiseptic, but there are men who do not understand its use and they have nothing but trouble. There should be no pain whatever. If there is it will subside and no harm is done, but it means that one should correct his technic. Keep away from the apical region with instruments. What the object is in forcing a foreign material through a root end in any case, I cannot see. Such a process disturbs the delicate adjustment of vessels and tissue that should properly cover the root-end and is unscientific. Nature is wonderfully tolerant and will encyst many foreign substances, but why ask it of her?

When we have a fistula, treat the tooth once with the silver solution; force Dakin's solution through the fistula once or twice, and if this does not cure it, repeat again. At the last treatment apply the silver treatment several times in succession and fill.

With a blind abscess do the same thing.

I have a record here, at the Forsyth, of more than four hundred cases treated by six or eight operators and we have extracted only three teeth. We have treated every description of cases. Operators have to master the technic, however, or they have their troubles. The efficacy of the treatment remains even if it is impaired through the lack of understanding of surgical and therapeutical principles.

Formalin alone does not effect the sterility that this process does, neither does the silver nitrate alone. It is during the activity of the chemical action that this is attained.

For a nicely cleaned cavity, phenol five minutes, followed by seventy per cent. alcohol is very effective as a sterilization process.

Eugenol and zinc oxid are quite antiseptic. Antispetic cements have but little antiseptic value according to my experiments, and they have been extensive.

All my studies have been conducted in the teeth in the head of the patient. Other experiments upon laboratory teeth do not represent the true state of affairs, and are limited in value. From what I have shown regarding the hyaline areas that occur in chronic abscessed conditions, it is evident that nature attends to such a condition in a very perfect manner when the cause is removed. The so-called granuloma is an attempt on nature's part to repair and wall-off the effect of instrumentation or of the mild tooth infection. We must bear this in mind in X-ray interpretation. Many an established protective process has been condemned by wrong interpretations. I believe that when we remember that nature as a rule is perfectly competent to take care of minor infections, that all protection against bacterial invasion comes from within the body, and that all processes of repair likewise are done by the bodily tissue, we shall feel that we have little fear from the teeth from an infective point of view.

There is no question but that there has been a great deal of needless extraction on the theory that the teeth are a causative factor in disease. In certain cases they may be, but this I believe to be the exception. The teeth are necessary organs. They are instruments in the digestive act. No one knows much about these general diseases attributed to the teeth. All are agreed that infections in and about the teeth are low in virulency. By injecting these organisms even in enormous doses one cannot produce a blind abscess or pyorrhea. The infection is secondary in my opinion. Clean up such areas of course, but do not condemn the teeth for obscure conditions, the cause of which is unknown. We should bear in mind the principles of immunity, a topic of too great magnitude for me to discuss here. I believe that we know how safely to conserve teeth, and that we should clean, fill, and treat oral conditions according to surgical principles and only as a last resort fall back upon extraction.

10 Exeter street.

A METHOD AFFORDING DENTURE SERVICE IMMEDIATELY FOLLOWING EXTRACTION*

BY ROBERT R. GILLIS, D.D.S., HAMMOND, IND.

WE FREQUENTLY meet with patients for whom it would be highly desirable to provide dentures immediately after we have extracted their teeth.

Such patients by reason of their pride in personal appearance, their reluctance to be seen without teeth, are willing to pay for the extra service involved in supplying them with dentures during that intervening period between the time of extraction and the time when the alveolar ridges are sufficiently dissolved that we may reasonably expect permanency in fit.

Men and women alike, often make a desperate effort to retain badly-diseased natural teeth just because they dread appearing toothless among their business and social associates.

In the light of our present knowledge concerning the subtle evils of oral foci of infection, our present effort is made with the hope that we may thereby remove the patient's last argument for the retention of diseased teeth.

The man of common labor or the shopkeeper whose work compels him to appear daily before his customers and converse with them; the woman whose duties in an office or schoolroom afford no leisure time during which she can go into retirement while waiting for teeth; all busy people as well as those persons of leisure whose social duties only are most to be consulted, appreciate our efforts to keep them dentally presentable.

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*Read before the Indiana State Dental Society, May, 1920.

In these modern times of stress and strife, "strep and staph" have created a condition that will compel a revision of Shakespeare's Seven Ages to the extent that the one qualification "sans teeth" applied to his seventh age, the age should be moved forward several lines and placed just after "sighing like a furnace,"—for I can imagine nothing that makes a person sigh more than to be told he must loose his teeth.

Through the method herein offered, we would make possible one further revision of Shakespeare's classic by eliminating entirely the words "sans teeth." Nobody now needs to appear sans teeth at any stage of life.

Nothing original is claimed for the system here described. We have selected the several steps in procedure from various methods, and have tried to assemble a technic that is adaptable to all cases.

For many years, a few dentists have aimed at like results by making impressions and bites of the ridges and teeth before extraction; recovering the casts and trimming off the teeth; then setting up and vulcanizing dentures over these modified casts. That method is accurate only to such degree as the operator is a good guesser, for he must trim the gingival contours by guess only.

Where pyorrhea has caused considerable recession of the gums, such an approximate method may succeed fairly well. Or, in a case presenting normal gum and ridge conditions, fair success may be attained by grinding the necks of the front teeth to fit the ridge, and not attempting to make a labial rim of vulcanite on the denture. We know from experience that dentures made without labial rims do not afford the same degree of efficiency as those made with complete rims.

The method herein offered makes it possible for us to construct a denture within a few hours after extraction that will afford greater efficiency than is possible from the older method of making a denture from impressions taken before extraction.

PRELIMINARY STUDY OF CASE

When the prospective denture patient first appears, we should immediately begin a close examination of conditions, studying the patient's features to determine all the facial peculiarities.

In talking with the patient, note the variations of action in the two sides of the face as to movements of the muscles of expression and mastication. You will be surprised to observe the asymmetrical conditions in most adults.

Observe to what degree the natural gums are displayed when the patient smiles and laughs; note the position and contour of the lips when the mandible is at rest; the length of the teeth in relation to the lip line; and any peculiarly atypical arrangement of the teeth. All these observations are to be made while the patient is entirely unconscious of your close scrutiny.

The writer has found no field in dental service wherein the patient and family and friends are so free to offer criticism as in denture service.

For this very reason, in anticipation of criticism, to forestall any unjust criticism, and to avoid future misunderstandings, we have found it to be to the mutual advantage of patient and operator to reach a thorough understanding on several points before the natural teeth are disturbed.

When it is agreed and determined that we are to go through with the case, we make and record some measurements and make some impressions from which casts will be made for future reference.

MEASUREMENTS

With a metric rule, measure the distance from the angle where the nose and lip meet in the median line to the incisal of the central incisor. It is well also to measure the distance from the angle at the alæ of the nose to the cuspid incisal.

With these measurements, you will be able to restore these distances in your denture—or make such variations as have been agreed upon previously.

Now measure in the median line from the nose-lip angle to the lower border of the chin; in this dimension, make two records, first with the teeth in full occlusion and second with the mandible at rest. There will be a variance of from one to six millimeters between these two positions, for with the mandible at rest the teeth are not in occlusion.

These measurements enable us to restore the natural length of bite for the case, insuring against making it either too long or too short.

In those cases where the natural teeth are much in evidence, we measure also the length of exposed area.

All these measurements should be recorded for future reference.

We next pass a small straight-edge or bar across the upper teeth just back of the cuspids, and ask the patient to close the lower teeth against the bar so as to hold it steadily in place while we observe whether it is parallel to a line drawn through the pupils of the patient's eyes. Any variance should be noted. This bar should be parallel with the eye-line. If any variance is evident, call the patient's attention to it at this time.

PRELIMINARY IMPRESSIONS

We now take a small roll of softened modelling compound; have the patient shut the teeth into full occlusion, relaxing the lips; place the compound over the front teeth (covering about to second bicuspid on each side), bring the lips over the compound, and then with a napkin over the lips press and burnish the compound against the teeth and gums. Remove when stone cold, and you have an impression from which you will secure a cast-relief of the labial appearance of this patient's teeth.

SECTIONAL IMPRESSIONS

The next step is to make sectional impressions of the upper and lower jaws and teeth. These are made in trays having no buccal or labial flange. We use compound again for the impression material. The teeth, after extraction, are set into their respective imprints in these sectional impressions, and models are secured therefrom that will accurately reproduce the characteristic features of that natural denture.

While making these preliminary studies and measurements, we have discussed with the patient his several peculiar features, and mutually agreed upon what features shall be reproduced and what ones altered or modified in the prosthetic denture. This is the time for the dentist to anticipate the necessary changes and inform his patient as to why such changes are necessary.

SELECTION OF TEETH

In the selection of teeth, I find all patients reasonable when we have their own natural teeth as a guide. Often it is desirable to have another member of the patient's family or some close friend assist in the selection of teeth. Seldom does a case present that requires any special diplomacy at this stage.

With these preliminary steps complete, we are ready to proceed with the operation for removal of teeth and portions of the alveolar process.

We will detail an application of the method to a case requiring removal of the upper teeth and process, and the making of a restoration to occlude with the natural lower teeth.

ANESTHETICS

The anesthetic of choice for this operation for removing the teeth and parts of the alveolar process is novocain employed in the nerve-blocking methods.

Any general anesthetic will put the patient in a condition that precludes our proceeding with denture construction immediately after the surgical work is done. Since time is an important consideration, we employ novocain nerve-blocking for, with it, there are no sequalæ that will interfere with immediate impression making and the succeeding steps.

REMOVAL OF TEETH AND ALVEOLAR PROCESS

When the parts are thoroughly anesthetized, the teeth and adjacent soft tissues should be cleared of all foreign substances by using gauze or cotton sponges, sprays of antiseptic solution, washed over with sixty per cent. alcohol, and then painted with menthol-iodin solution.

In order that we may keep the parts in good condition while operating, it is advisable to divide the whole field into sections and operate upon them as consecutive steps. Do not attempt to cover too much territory at one step. It is better that we should take only four or five teeth for one step, or just those in one-half of the jaw (either upper or lower), and do this much thoroughly and in a cleanly manner, rather than to attempt making a complete extraction before trimming any of the process.

When the teeth and adjacent soft tissues have been made ready for the extraction, our first instrument used is the lance. Make a clean incision continuously along the labial or buccal gingival border of as many teeth as have been selected for the first step, then make a like incision in the linguo-gingival border.

These teeth are then carefully extracted. If any root fragments break off and remain in the process, do not attempt further to remove them now, but wait until the later stage when the tissues are opened wide and ready access afforded.

In the next step, we carefully lift the labial and buccal mucoperiosteal tissue from the process, beginning at the incised gingival border, and working it upwards so far as we have predetermined the process should be removed. It is seldom ever necessary to disturb the lingual mucoperiosteum.

With suitable bone-cutting forceps or rongeurs, we then remove the bony septa between the alveoli and then the labial or buccal plate of process to a distance extending from one-half to two-thirds the depth of the alveolus. Once in a while a case presents wherein it has been necessary to go even beyond the apex of the alveolus, but such cases are unusual.

At this stage of the work, we must be on the lookout for pathological bone conditions. We nearly always have X-rays to guide us in this work, and we now fail to be surprised to find conditions worse than the X-ray indicates.

Some operators make extensive use of chisels, others employ bone burs and stones for the removal of the process. The writer has had best success with a suitably-shaped rongeur. With this instrument, we first bite out sections with a labio-lingual cut and then go over this edge with a mesiodistal cut. This mesiodistal cut is for the purpose of smoothing the alveolar border, freeing it of any minor points or projections. The same trimming or smoothing may be accomplished with an antrum rasp or a heavy bone curette or bone burs or stones.

The lingual border of process is likewise smoothed off but not reduced materially; all debris should be flushed out with warm saline solution.

Now the gum flaps, whose edges were freshened by the lance prior to extraction, are brought back to place and approximated. If any considerable quantity of process has been removed, the labial and buccal flap will be too long; it will overreach the lingual border. Observe the distance it overreaches, and with surgical scissors remove the surplus tissue. At this stage, aim to prepare both flaps so that when sutured together they just reach each other nicely to close the wound in an even, clean line, having neither a stretching nor a flabbiness of the labial flap.

Horsehair, used with the continuous suture, has been most satisfactory in our practice.

The several steps of surgical procedure thus hastily outlined, offer a great advantage in that we are now able to set the necks of our porcelain teeth into the position formerly occupied by the natural tooth neck; and furthermore we can have room for a liabial rim of vulcanite.

By the older methods we would wait for months for the dissolution of this labial and buccal alveolar border, and even after patiently waiting be compelled at times to set the teeth in a rather forward position and dispense with the labial rim on our denture.

As long as nature takes away this process ultimately, we might as well anticipate nature and remove it surgically, thus hastening the time when our patient can be comfortably equipped with artificial dentures.

IMMEDIATE IMPRESSIONS

When the surgical steps are completed, we take any one of the ordinary impression trays that will fit to the mouth so that the rim of the tray reaches up to the reflex of the lip and cheek attachments and clears all the ridge tissue. In the heel, the tray must pass the tuberosities and extend slightly onto the soft palate. Thus it is slightly larger in all dimensions than our denture will be.

Dry the tray and warm it; then with stick compound lay on a bead of compound just inside the rim of the tray and extending entirely around the labial, buccal and heel. Dip into water heated to one hundred and sixty degrees to soften the compound uniformly and pass into the mouth. Let the seating of the tray be guided solely by the middle finger held in the median line well back on the tray. The rim of soft compound comes into contact with the tissues above and beyond the operated areas and affords a well-fitted rim.

A hole is now drilled through the vault of the tray with a No. 4 bur; a plaster wash is placed in the tray and carried back into place in the mouth. Our well-fitted rim would make difficult the escape of surplus plaster as the tray approaches its maxiumm seating. This little hole in the vault of the tray affords a vent for the excess plaster.

The impression complete, we now examine the vault with considerable pressure of the index finger to determine the location of any hard parts. These areas should be relieved by scraping the impression just made.

Paint the impression with separating medium and pour with plaster of Paris. This impression and cast secured from it are only approximately correct, so it is permissible to use plaster of Paris and add potassium sulphate to hasten the setting. In five minutes we can shave off the impression plaster and recover the cast.

Over this preliminary cast we warp a base plate of material that will withstand the heat of the mouth. For this purpose, S. S. W. Ideal Base Plate has been found very satisfactory. Trim the base plate to the approximate limits of the proposed denture and remove from the cast.

Carry this base plate to the mouth, and test it for rim height as accurately as can be with open mouth inspection and determine that the length in the vault is satisfactory. We want the base plate rims to be about one millimeter lower buccally and liabially than the finished denture. We want the base plate to extend four millimeters back onto the soft palate between the tuberosities. This base plate will usually be sufficiently well fitted so that it will retain its position in the mouth unaided.

THE BITE

Now have the patient close the lips and swallow with the base plate in the mouth, coming to a rest position of the lips and mandible when the act of swallowing is done. Following the Greene-Supplee technic for establishing the bite, we direct the patient to retain this position of the mandible while we part the lips with our fingers and observe how much space is between the base plate and the lower teeth. This space is to be filled with ordinary base-plate wax. Add this wax to the hard base plate, just as we ordinarily build up bite waxes—except that for our present purposes we desire a little excess in length occlusally.

The occlusal plane and length of bite is now established in the mouth by the steps and procedure employed in the Supplee method of impression making.

Having trimmed the wax bite approximately with a knife, warm its occlusal surface to a slight depth; return into the mouth; have the patient close the lips and swallow. If the expression of the lips is tense and drawn, have them swallow again and bite. Ofttimes this step must be repeated, warming the occlusal surface of the wax bite before each effort, and trimming off the surplus afterward, so that only the indentations of the occluding cusps are evident in the occlusal surface of the wax. Be sure at all times to maintain a flat occlusal surface.

By reference to the record of our preliminary measurements and to the study casts, we can now determine to a nicety when we have established the desired length of bite and fullness of contour. Remember right here that the patient's upper lip is not a safe guide just now, for it is still anesthetized and is longer and thinner than normal. This fact emphasizes the necessity of having some other guide such as is afforded by our records previously made.

When satisfied with the length of bite and fullness of contour, we are ready to proceed with the setting in of the teeth.

In arranging the teeth, we begin with the first molar on one side, cutting out enough wax to allow it to sit into position; then set the opposite first molar.

As these teeth are put into approximate position one by one, we return the base-plate to position in the mouth and bring the lower teeth into occlusion. This enables us to place each tooth most advantageously.

Following the first molars, next place the bicuspids and then the second molars, if the space is ample. If crowded for space, we grind and set the second molars last after all the other teeth are in place.

With the bicuspids in place on both sides, it is time to proceed with the front six teeth, arranging them to suit the space, occluding teeth, and esthetic sense of yourself and patient.

As each tooth is arranged to satisfaction, we have found it advisable to secure it in place with some harder wax, like Kerr's setting-up wax. This gives more assurance that the arrangement will not be spoiled while setting subsequent teeth.

All the teeth are now in position and we wax up the lingual practically to a finished model, and wax the labial and buccal so that the desired contour will be complete almost to the rim of the base.

Our base plate should now be post-dammed by means of a little roll of black carding wax applied across the heel, warmed, and pressed to position. This insures a perfect seal in this part of the denture—a thing just as important as perfect rim fit throughout the balance of the periphery of the denture.

At this stage, we resort to the plaster of Paris wash again. We convert our base with the teeth set up, made from an open-mouth impression, into an impression tray with which we secure a closed-mouth impression under slight occlusal stress.

From this point forward to completion, the procedure is nothing different from what any good, careful laboratory technic teaches.

Trim the plaster impression from tuberosity to tuberosity just as you desire the finished denture to be; we pour this impression with Brophy's Artificial Granite which is a material that sets as quickly as plaster and which is claimed to be free from expansion or contraction. Complete the waxing, having first removed any excess plaster from the lingual surface and outer rims; flask, pack, vulcanize and finish "as all good dentures should be."

Call in your patient and deliver the goods!

You have given your patient a denture that he can wear today, and maybe months or years, with now and then the usual trimming to accommodate new pressures and stresses as he becomes more and more accustomed to the new device. You have not compelled him to go about for weeks with a wrecked articulation, which results always in an overstretching of the capsular ligament in an effort to rest the mandible or masticate food; you have relieved him of much misery that is suffered because of cramping of the muscles when without teeth; you have obviated the forming of the bad habit of protruding the mandible in masticating—a habit that most edentulous patients acquire in a very short time. Your patient after just a few hours of toothless retirement, can appear again and attend to his business or social duties without embarrassment. Your patient will *not* suffer as much from sore gums while wearing this denture as he would without it, and in a few weeks he will have a better ridge than he would have had under old methods after waiting weeks or months.

The expressions of comfort that the patient makes are most gratifying. Nearly every patient after twenty-four hours is convinced that he is more comfortable with than without—and right there the greatest difficulty is passed for the denture prosthetist. Whenever your patient realizes that his personal comfort is increased by keeping the denture in his mouth, that patient will readily learn to use the denture.

Please bear in mind also that the patient has not had time to forget how to use teeth; normal mandibular control has not been lost; improper habits of mandibular movements have not been formed. The transition from natural denture to prosthetic denture is surprisingly easy.

For yourself, you have eliminated the use of any articulator except the *one best one,* which is the patient's own temporomandibular joint. On it, you can open or shut the bite without fear of creating an incompatible relation between articulation and occlusion. You can make an arrangement of teeth that is harmonious in all respects and a more accurate duplication of nature's organs both as to form and position.

In some cases where both upper and lower teeth are to be lost and replaced, we have made a practice of operating upon and restoring the uppers first; making this upper denture to occlude with the natural lowers (having ground off any elongated lower cusps and established thereby a consistent occlusal plane).

Allow the patient some time to become acquainted with the upper denture and learn how to use it. Then proceed with the lower operation and restoration.

This procedure has given success in cases where we simply felt like throwing up our hands in utter dismay and sending the patient away when the case first presented.

56 Rimbach Ave.

DISCUSSION

DR. G. E. JOHNSON, Ft. Wayne: It is a universal law that everything mundane, terrestrial and cosmic travels in cycles; even history herself repeats; and to the older members of the dental profession it is amusing to see the younger members bringing forth out of their fertile brains, modes and practices which half a century or more ago were pronounced obsolete.

We are practicing dentistry today not as a profession exclusively all of and within itself, but as a branch and a specialty of the parent science, medicine and surgery; and when we practice dentistry as a fine art and a science (which is inseparable from medicine and surgery) we are grounded in the same fundamental principles of anatomy, physiology, pathology, consideration of infections and immunities which are overlapping, intermingling, intertwining of the branches of dentistry and medicine.

The patient goes to the physician or to the surgeon of his choice seeking advice or counsel and help. They do not seek him and then tell him what and how to do for them.

A man goes to his tonsorial artist, the barber, and tells him that he wants a hair cut, shave, facial massage or a shampoo; and the patient goes to the dentist and tells him, too frequently in like manner, that he wants his teeth cleaned, a gold or silver filling inserted, or the replacement with a set of artificial teeth the same day the teeth are extracted, and the dentist ordinarily never enters a protest. Not so in medicine and surgery. The minute the patient enters the door of the dental practitioner, the dentist is or should be master of the situation. He should make a complete physical diagnosis, or as the dentist would term it "the once over," or an examination at least, informing the patient what should be done for his or her own good. But to begin with, the dentist must have a specific preparation and must carry with him the force of character and the benefit of accumulated knowledge and experience which would enable him to impress upon the patient's mind that he really is master of the situation, and able to put a quietus to any arguments which he or she might see fit to put up.

Forty to fifty years ago it was a fad for people to have teeth extracted, good, bad and indifferent, that they might have a new and beautiful set of artificial teeth inserted. It seems that we are again entering this self-same cycle. I quote from the *Dental Quarterly:*

"Fads or beliefs, fashions or theories, call them what you may, travel in cycles, even in dentistry. Ionization of today is an elaboration of the cataphoresis of yesterday. Manufacturers of dental golds tell us the demand for foil gold has recently markedly increased at the expense of casting golds. Infiltration and conductive anesthesia is being practiced and given preference in some of the most difficult oral surgery cases by the very same operators loudest in their praise of nitrous oxid and oxygen only a few years ago. Nitrous oxid itself has probably had the center of the stage oftener than any other dental drug. A recent pamphlet gives dates of 1800, 1823, 1844, 1868, 1880, culminating in the great wave of enthusiasm over N_2O and O analgesia and anesthesia of 1910 and after.

"Amalgam has had its ups and downs, until at the present moment it has more devotees, is more universally used, and because used more, is perhaps better understood, than any other filling material we have. Amalgam is destined to become one of the real standbys of dentistry.

"Root-canal work swings from 'mummifying pastes' and gutta-percha points to zinc oxychlorid cement, or total removal of the tooth, with every method able to exhibit a very substantial percentage of perfectly comfortable and therefore successful operations.

"The most recent large scale revival of an older practice is that of pulp capping. Men advocating this procedure naturally include those who demand the removal of every devitalized tooth, and therefore make every effort to save the pulp. Pulp capping is one such means, and promises to be practiced more and more.

"Partial dentures as opposed to bridge work is another instance of reversion to practices before the advent of dental bridges. A reluctance to devitalize for post anchorage or other preparation is overcome by supplying small partial dentures or 'removable bridge plates'."

I remember well of having discontinued the method of affording denture service immediately following extraction over forty years ago. I found it so exceedingly unsatisfactory, unmechanical and unsurgical that today I would hardly recommend or feel like commending it to the younger members of the profession. So you see I have taken a step diametrically opposite from that which Dr. Gillis has propounded, and I can only concede to one point in his excellent paper which I can recommend and approve and that is, "Nature's own articular, the best one, the only true one and efficient one, which is the patient's own temporomandibular joint connecting the masticatory apparatus."

Dr. Gillis says: "We frequently meet with patients for whom it would be highly desirable to provide dentures immediately after we have extracted their teeth. Such patients by reason of their pride in personal appearance, their reluctance to be seen without teeth, are willing to pay for the extra services involved in supplying them with dentures during the intervening period between the time of extraction and the time when the alveolar ridges are sufficiently dissolved."

This preface to Dr. Gillis' paper savors of his willingness to do that which is unmechanical and unsurgical and for a compensation; and that which many times may prove a positive injury from a surgical point of view.

Dr. Gillis further states, "That in the light of the present knowledge concerning the subtle evil of oral foci of infection our present effort is made with the hope that we may thereby remove the patient's last argument for the retention of diseased teeth." From a surgical point of view the doctor sees fit, for a compensation, to open fresh wounds, and into old foci of infection within the oral cavity which is ever an infected field.

He certainly is a good guesser if he can tell how far nature will destroy the alveolar ridge, and instead of giving good drainage to the wound, which is a well known surgical procedure, he sees fit to dam up and impound the infected matter within flaps sutered to each other, covering and entirely enclosing the newly-made wound, which cannot be other than a traumatic lesion, following which there must necessarily be swelling and a breaking down of tissues before nature's repair can be made. Then to proceed immediately to make a replacement of the lost organs connected to a dental plate, further damming-up and favoring an extension of infection within an already infected field. And this is the kind of surgery that Dr. Gillis is presenting to the younger men of our ranks; and in order to accomplish the result, is recommending and employing infiltration or block anesthesia, which is another surgical traumatism from a pathological and bacterialogical point of view!

We will take, to begin with, the difficulties encountered in doing a filtration or block anesthesia. You are introducing one-third of a grain of procain, 1/2500ths of a grain of adrenalin, with a quantity of Ringer's solution or a physiological sodium chlorid solution. The physiological principle of the first agent, procain or novocain, is that of an anesthetic, and that of adrenalin chlorid is that of hemostatic; that of sodium chlorid or Ringer's solution is to produce an isotonism. As a pharmacological product, this is a happy combination, used locally or superficially, but in a deep-seated injection cutting off nerve supply, I do not consider it good surgery.

Injecting in and around or about the nerve ganglia, you are producing both a mechanical and a chemical traumatism, which means a blocking of the blood and nerve supply in the surrounding tissue, thereby lowering the vitality and although no infectious matter may be introduced by or through the hypodermic needle, yet in the area of lowered vitality of tissue, or, as I stated before, this region of mechanical and chemical traumatism, it is possible that we may have what is termed a "cryptogenic infection."

Some may ask the meaning of "cryptogenic infection;" in answer I reply that bacteria and other micro-organisms may be introduced by wandering cells of the organisms, and being so introduced, may be conveyed by lymph or the blood stream to various regions where, coming to rest, they may proliferate and set up an infection.

Many cases have been referred to me of post-pain and post-infection following nerve blocking, and the infiltration methods for the trivial matter of the extraction of a tooth or a number of teeth. The patient invariably inquires, "Why so much pain, why so much swelling, why so much infection, and why all this copious discharge?" and it is up to me to excuse the dentist as best I can.

As proof of the foregoing we not infrequently encounter cases of tuberculous cervical glands in children without a sign of tuberculosis of the fauces or of the bronchi or the lungs; active tuberculosis of the mesenteric glands with the mucosa of the intestines showing not a single ulcer; and at times we meet with acute localized osteomyelitis due to streptococci, with no history and no sign of local surface irritation anywhere. Similarly an acute nephritis or cystitis may suddenly supervene with no ulcerative lesion found anywhere at autopsy to explain its origin. This will explain, I think very clearly, why patients suffer so severely at times from post-pain, and why they suffer infection of the parotid, submaxillary and sub-lingual glands. You may be ever so careful in the sterlization of the hypodermic and of the skin or mucous surface, and yet by the lowering of the vitality of the tissues by nerve blocking or by infiltration, you are inviting an infection which is far worse than to operate without an anesthetic.

Since getting into this discussion I would like to ask Dr. Gillis if he would do an infiltration around or about an infected tooth, or, for that matter, a number of infected teeth; and, even though he were to use or rather inject only distilled water, in injecting into or through an infected tissue, would he not be forcing the infection, or the toxins of the infection, deeper into the tissues and beyond nature's natural blockade, nature's little army of leucocytes, thereby spreading the infection?

Members of the Indiana State Dental Association, I want to go on record with the statement that I do not believe that any ganglia or nerve trunk which has been blocked with the aforesaid anesthetic is ever quite as good thereafter; or, in other words, ever quite recovers from the mechanical and chemical traumatism which has been produced.

I well remember a number of years ago anesthesia was produced by injecting into the spinal cord many varieties of anesthetics, among which were morphin-skopolamin, hyoscin, etc., under which major operations were performed upon the lower extremities and even abdominal operations, the patient remaining conscious; with the selfsame result I have just referred to in the blocking of the fifth pair of nerves. Many cases of partial or complete paralysis of the lower extremities was the result. You will note the effect of an injection at this point would produce an artificial locomotor ataxia just as certainly as a gumma of the spirochæte pallida of Schaudin, which may seem to the dental profession a statement very farfetched; but I bring it in to still further furnish proof that nerve blocking is not a good practice. The principle is wrong, and a thing wrong in principle is never good practice in medicine or surgery.

It seems in all of the experimental arts and sciences that the people, the dear people, must pay the penalty, and along this line there is an old saying that, "The barber learns his trade on the fool's face, the dentist in the fool's mouth, and the surgeon in the fool's belly;" but with this warning I hope all those within hearing of this discussion may think several times before they operate once.

"Be not the first by whom the new is tried, nor yet the last to lay the old aside." I think that general, dental and oral surgery are sufficiently standardized that we may at least continue to prove ourselves benefactors of the race.

Dr. J. A. Dinwiddie, Lowell: It certainly has been a pleasure to listen to the clean-cut, to-the-point paper just presented by Dr. Gillis, and I want personally to thank him for presenting it to the Indiana State Dental Association.

He has given us something that all can use if we are serving our patients as we should. This idea of the patient going without teeth for six months never did appeal to me, and I always have advocated the immediate denture service, and my patients surely have appreciated it.

The success of the immediate denture is greatly improved by the technic employed by the essayist, of removal of all bony tissue that is to be absorbed if the case were left for nature to do the work, and the method has surely proved to be a very big help in my practice. I have no words of criticism to offer and only words of commendation for it is the best method that I can employ with only slight changes.

I quite agree with the essayist in the remarks on the preliminary study of the case, and we surely can not be too careful in observing the expression, facial contour and length of teeth.

The saying, that the "artificial are so natural that they ache," is almost true in many instances; and it is a pleasure to work when one is capable of restoring the appearance and proper function after the loss of the teeth.

The method of removing only a few teeth then preparing this area, and suturing, then removing a few more, prepare and suture, may be the best technic. However, it has been my practice to remove the posterior teeth first and prepare this area, then at another appointment remove and prepare the anterior portion of the mouth.

I would suggest that in taking the final impression that after the teeth are all arranged, waxed, post-dammed, that the upper base plate be reinforced across the heel from tuberosity to tuberosity, with a strip of base-plate material or a very stiff wire waxed to the base plate. This gives you a more rigid base plate and when, in the final impression by the closed-mouth method, you will not have a warping or springing away of the base plate from the palate, thereby losing the effect of the post-dam that has been previously made with the carding wax.

The technic has been very carefully worked out and given to you by the essayist, and I am sure if once you try it, you will be pleased with the results and your patients delighted.

DR. BROWN, Elwood: If this method is as good as Dr. Gillis says it is, wouldn't he perform that operation in every case, because he can get better articulation, people will become accustomed to using their teeth better—and why shouldn't he use it in every case?

DR. ROSENTHAL, FT. Wayne: I just want to say that I can scarcely understand Dr. Johnson's discussion of this paper. He evidently has the idea for one thing, that we remove the maxilla entirely, and I do not see where he gets that. The essayist did not say so. He said he removed the process that nature would remove. There is an absorption, and that process will be removed. We are only hastening what nature will do for us in this respect.

As to conductive anesthesia, it would seem that Dr. Johnson has not practiced that as it has been practiced in medicine and surgery for years. No ill results have come from it when properly done.

I want to compliment Dr. Gillis in the highest terms for the paper he has given us. I do not believe his method can be beaten.

DR. WILSON, Danville, Illinois: Dr. Gillis has taken the pep out of a case I was rather proud of, where I put in a plate two days after the extraction. It was a professional nurse, and she wanted to sing a solo on Saturday night. This was Thursday. I thought she was joking, and said, "Sure, I will fix you up." I later found she was in earnest. She sang her solo, and she did not lose a meal. She wore that plate on horse hair sutures. That case has had as little soreness as any case I ever operated on.

DR. ARMANTROUT: As one of the young men in the profesion, I want to thank Dr. Gillis for his instruction along these lines. I am rather surprised that all of the older men have not taken up anything as good as block anesthesia.

DR. LE GALLEY: I did an operation like this a short time ago for a real estate man. Within a day or two I put the plates in his mouth. I did not see him until he came back from a trip to Fort Wayne about a week later. This gentleman is still wearing the teeth, and with the exception of a little trimming nothing has been done to them, and they are getting along well.

DR. PAGIN, Valparaiso: I have frequently extracted teeth and made impressions immediately. I remember one case that actually happened of a young lady coming in at noon. She said a young gentleman was coming so see her at seven-thirty that evening. I made the impression, and she met the young man at seven-thirty, embraced him and kissed him, and he didn't know she had artificial teeth.

When you make the teeth immediately after extraction, I do not believe you get the resorption you do if you wait.

Post-operative pains for nerve blocking have been a source of trouble to me.

DR. HOWARD SMITH: If you clean up the alveoli and stitch it up, and do it right, I believe you will get the results of which Dr. Gillis has told us. I think this practice will be taken up more and more as time goes on. We learn only by trying out these new things. Unless we do, we older men cannot hope to progress.

DR. PEAS: Dr. Hartzell condemned alveolectomy, and that proves to me that he has not been making dentures. In most of my denture making I put them in within a day or two. I haven't carried it out quite as Dr. Gillis has. I do not take all of the teeth out at once, but leave some of the teeth for a few weeks. I take plaster impressions, and break the front away, regulate my case, set up the teeth. Then I remove the remaining teeth, and curette the alveolar plate down. I believe you can curette out even tissue that is necrosed. I have done that for a long time, and have had no trouble. If the curettement is well done, as I know Dr. Gillis would do it, and the mouth is clean, I know that mouth will promptly heal.

This has been one of the best papers of the week. I just want to add further that no one can stop the use of conductive anesthesia.

DR. STOKELEY, South Bend: One fear I have is that every one will not do this work as carefully and as skillfully as Dr. Gillis does. A man beginning this work should not be too extreme. Conductive anesthesia is good, but sometimes the patient would be better off if the operation were done under a general anesthetic. There are some cases where the infection of the mouth is extreme, and with a certain type of patient, the operation should be done under ether.

It would be well for the beginner in doing this work to remember that all he intends to take off is the process, and not any part of the jaw bone proper.

DR. GILLIS (Closing): I took up this subject because it was one of intense interest to myself. When I looked at the program and saw the other features to be given, I feared what I had to offer would be almost child's play. I am glad the discussion has been as extensive as it has. I do not believe Dr. Johnson has said anything he did not mean to say. I think, however, he has written a part of this discussion from the synopsis I sent him before I made up my paper complete. When he said this technic was practiced many years ago I think he referred to some of the things in that synopsis.

The matter is not obsolete. It is only within the past few years that men have been attempting the surgical technic followed by the denture technic. Some surgery was done, but not the extensive removal of the process. I said this is not original with me. This is simply an assembly of a number of good points taken from good technics.

I should not allow my patients to dictate what service they should have. It is possible this may be a fad. I do not consider it a fad, but a necessity. This discussion shows there are places other than Hammond where the people want prosthetic dentures as quickly as possible after losing their natural dentures. Most fads do not live long. This technic has been followed for a number of years. I presented a table clinic on this here two years ago, and many seemed interested in it, at that time.

I of course agree with Dr. Johnson as to his statement about the articulator; the best articulator is the temporomandibular joint itself.

We are not always dealing with pathological conditions. Where the field beyond the apex is in a pathological condition, my experience has shown when that is thoroughly opened and cleaned, it may be closed up with just as much confidence that nature will take care of the disturbance as when an abdomen is opened up and a pathologic appendix is removed.

As stated, I use the local anesthetic because I do not want to put the patient in a condition where I cannot proceed immediately with the denture construction. You cannot do that under a general anesthetic. I would recommend to Dr. Johnson that he take Dr. Arthur Smith's course on nerve blocking. The immediate area of operation has no medicament in it.

As to the after-pains following surgical work with nerve blocking, no one should criticise after-results unless he knows the absolute conditions with which the operator contended. We would not inject directly into the apical area. You very often place your medicine two or three inches from the immediate field of operation.

I fear I have given Dr. Dinwiddie the impression that I would extract, remove the process, suture one field, and then go to another. That is not so. My final trimming of the flaps and suturing is the last step after each of the several bone steps have been operated. His suggestion as to reinforcing the heel is very commendable.

Would I operate in this way in all cases? No. When the prospective denture patient comes in, we explain what can be done. We show the old technic and the new technic, and give the patient his choice.

Returning to the matter of after-pains, did you not have after-pains before you used novocain? after gas anesthesia? and after chloroform and ether? and even when you took out the tooth without an anesthetic? With those cases where you use novocain, sometimes you have after-pains and sometimes not. Most of your after-pains follow extraction cases rather than the use of novocain for cavity preparation or pulp removals, and those after-pains are due in most cases to surgical trauma, and in the other cases to poor technic. By whatever degree you diverge from the true path, by that degree you have after-pains.

Some time ago I felt antagonistic to novocain for two reasons; *first*, because of my past experience with cocain, and I blamed all hypodermic anesthesia when I should have blamed cocain or my poor technic; *second*, I was getting good results with nitrous oxid and oxygen. Now I get good results with novocain, and do not need the other.

I do not believe "resorption" or "absorption" as applied to the disappearance of bony processes is perfectly applicable. I think it should be "dissolution." What actually happens is that the circulation in the part dissolves away that tissue and carries it off in the blood-stream.

One of the most convincing papers I ever heard was read by a man who was confessing his errors in technic. The human element will creep in and there is plenty of chance for error. I have made many mistakes in this denture making. We are learning more and more of the risks involved in general anesthesia, and I do not think any dentist is justified in assuming the risks of a general anesthetic in his office or at the patient's home, if a hospital is at all available.

One thing I forgot in the paper was that it is well to take the profile of your patient. That can be done with soft lead-fuse wire, starting at the median line of the forehead, and bringing it right down the median line of the face.

If I take out the teeth Monday morning, by Tuesday evening the patient has his dentures, and he should eat the next meal with them. I did not intend to give the impression that I know how much of the process nature was going to take away. I have had cases where I had to reline the rim, not the palatal portion, in about six weeks' time. In some cases, even with your old technic, the gums after two or three years are rough, showing the bone forms into the denture as a mold.

As to sutures, some use chromatized catgut. The horse hair, however, does not slough out, and does not make a big knot. I sometimes sew it over and over, so that we have just one knot for each end, two in all. Take the impression right over that.

In closing, I want to thank the gentlemen who have discussed the paper.

A REPORT OF FIFTEEN HUNDRED DENTAL EXAMINATIONS WITH REFERENCE TO SYSTEMIC DISEASE*

BY J. P. JONES, D.D.S. AND B. S. GARDNER, D.D.S.
SECTION ON DENTAL SURGERY, THE MAYO FOUNDATION, ROCHESTER, MINN.

THIS REPORT is based on the dental examination of fifteen hundred consecutive patients observed in the Mayo Clinic. Since fourteen hundred and seventeen of the fifteen hundred patients came for relief from various illnesses, it is obvious that these data differ markedly from the data of the general practitioner in dentistry. The other eighty-three patients were not referred from clinical departments and the dental diagnosis was made without reference to a general examination, thus comparing with the patients whom the general practitioner meets. In all cases full mouth roentgenograms were taken, and the diagnosis made with the patient present, so that all roentgen data could be checked with the clinical findings. The cases are herewith tabulated:

TABLE 1

ONE THOUSAND FIVE HUNDRED CONSECUTIVE CASES

	Teeth	Cases
Patients with disorders of the stomach (90.2 per cent. had infected teeth)		302
Infected teeth	1339	
Devitalized teeth condemned	717	
Pyorrhea teeth condemned	333	
Patients with pyorrhea		253 (83.7%)
Impactions	58	34 (11.2%)
Roots	78	41 (13.5%)
Patients with duodenal and gastric ulcer (92.0 per cent. had infected teeth)		63
Infected teeth	221	
Devitalized teeth condemned	100	
Pyorrhea teeth condemned	0	
Patients with pyorrhea		45 (71.4%)
Impactions	4	2 (3.1%)
Roots	6	4 (6.3%)
Patients in poor general condition (87.6 per cent. had infected teeth)		195
Infected teeth	801	
Devitalized teeth condemned	476	
Pyorrhea teeth condemned	170	
Patients with pyorrhea		146 (75.3%)
Impactions	34	16 (8.2%)
Roots	52	27 (13.3%)
Patients with arthritis (87.8 per cent. had infected teeth)		140
Infected teeth	530	
Devitalized teeth condemned	363	
Pyorrhea teeth condemned	65	
Patients with pyorrhea		108 (77.1%)

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*Presented before the Indiana State Dental Association, Indianapolis, May, 1920.

Impactions	7	4 (2.8%)
Roots	30	14 (10.0%)
Patients with myositis (89.5 per cent. had infected teeth)		96
Infected teeth	399	
Devitalized teeth condemned	229	
Pyorrhea teeth condemned	86	
Patients with pyorrhea		80 (83.3%)
Impactions	14	8 (8.3%)
Roots	29	9 (9.3%)
Patients with lesions of the heart (88.1 per cent. had infected teeth)		76
Infected teeth	403	
Devitalized teeth condemned	239	
Pyorrhea teeth condemned	96	
Patients with pyorrhea		63 (82.8%)
Impactions	12	7 (9.2%)
Roots	24	9 (11.8%)
Patients with kidney disorders (92.9 per cent. had infected teeth)		71
Infected teeth	320	
Devitalized teeth condemned	156	
Pyorrhea teeth condemned	103	
Patients with pyorrhea		52 (73.2%)
Impactions	8	6 (8.4%)
Roots	28	17 (23.9%)
Patients with backache (88.7 per cent. had infected teeth)		71
Infected teeth	278	
Devitalized teeth condemned	170	
Pyorrhea teeth condemned	56	
Patients with pyorrhea		55 (77.4%)
Impactions	21	12 (16.9%)
Roots	12	8 (11.2%)
Patients with headache (88.0 per cent. had infected teeth)		67
Infected teeth	296	
Devitalized teeth condemned	229	
Pyorrhea teeth condemned	17	
Patients with pyorrhea		46 (68.6%)
Impactions	4	4 (5.9%)
Roots	16	10 (14.9%)
Patients with neuritis (90.0 per cent. had infected teeth)		50
Infected teeth	227	
Devitalized teeth condemned	125	
Pyorrhea teeth condemned	29	
Patients with pyorrhea		42 (84.0%)
Impactions	26	12 (24.0%)
Roots	19	8 (16.0%)
Patients with gallbladder disease (91.5 per cent. had infected teeth)		59
Infected teeth	257	
Devitalized teeth condemned	146	
Pyorrhea teeth condemned	76	
Patients with pyorrhea		41 (69.4%)
Impactions	4	1 (1.6%)
Roots	8	6 (10.1%)
Patients with anemia (92.3 per cent. had infected teeth)		26
Infected teeth	133	
Devitalized teeth condemned	64	
Pyorrhea teeth condemned	32	

Patients with pyorrhea		20 (76.9%)
Impactions		
Roots	15	6 (23.0%)
Patients with goiter (87.5 per cent. had infected teeth)		24
Infected teeth	116	
Devitalized teeth condemned	81	
Pyorrhea teeth condemned	11	
Patients with pyorrhea		15 (62.5%)
Impactions	4	3 (12.5%)
Roots	14	4 (16.6%)
Patients with ear trouble (94.7 per cent. had infected teeth)		19
Infected teeth	80	
Devitalized teeth condemned	39	
Pyorrhea teeth condemned	12	
Patients with pyorrhea		16 (84.2%)
Impactions	7	3 (15.7%)
Roots	2	1 (5.2%)
Patients with miscellaneous diseases (87.5 per cent. had infected teeth)		158
Infected teeth	532	
Devitalized teeth condemned	314	
Pyorrhea teeth condemned	89	
Patients with pyorrhea		117
Impactions	18	14 (8.8%)
Roots	31	23 (14.5%)
Patients not referred (59.0 per cent. had infected teeth)		83
Infected teeth	206	
Devitalized teeth condemned	127	
Pyorrhea teeth condemned	47	
Patients with pyorrhea		59 (71.0%)
Impactions	10	7 (8.4%)
Roots	6	3 (4.3%)

TABLE 2 GENERAL SUMMARY

	Teeth	Cases
Patients Examined		1500
Patients referred by examining physician		1417
Patients without infected teeth		175 (12.3%)
Patients with one or more infected teeth, (apical, pyorrhetic)		1242 (87.7%)
Patients with pyorrhea		1136 (80.1%)
Infected Teeth	5932	
Devitalized teeth condemned	3448	
Pyorrhea teeth condemned	1175	
Impactions	221	130 (9.1%)
Roots	364	187 (13.2%)
Patients not referred by examining physician		83
Patients without infected teeth		34 (41.0%)
Patients with one or more infected teeth, (apical, pyorrhetic)		49 (59.0%)
Patients with pyorrhea		59 (71.0%)
Infected Teeth	206	
Devitalized teeth condemned	127	
Pyorrhea teeth condemned	47	
Impactions	10	7 (8.4%)
Roots	6	3 (4.3%)

Average age of patients 39 plus years.

It may be noted that there was not a marked difference in the percentage of infected teeth in the different groups of cases. The high percentage was 94.7 in patients with ear trouble, and the low percentage was 87.5 in patients with goiter. It may also be noted that in the group not referred, the percentage was 59.0.

About the same variation of percentages occurs in cases of pyorrhea. The high percentage was 84.2 in patients with ear trouble, 84.0 per cent. in patients with neuritis, 83.7 per cent. in patients with stomach trouble; the low percentage was 62.5 in patients with goiter.

In the group of patients with impacted teeth, those with neuritis showed the highest percentage (24.0). The twenty-six patients with anemia had no impactions.

ARTIFICIAL DENTURE CONSTRUCTION

BY DR. RUPERT E. HALL, CHICAGO, ILL.

The Buffalo Prosthetic Club, composed of members of the class who took Dr. Hall's course, in April, has arranged for his return to conduct another class in artificial denture construction, at the dental department of the University of Buffalo, during the week of July 26, beginning at 9:00 A.M., and ending Saturday, July 31. The course will be practical, and will consist of a full upper and lower denture, a full upper against natural lower teeth to show method of accurately occluding and articulating porcelain teeth and natural teeth, and the rebasing of an ill-fitting upper denture not requiring re-arrangement of the teeth or renewal of the gums.

The class will be limited to fifty, and anyone desiring to enter ought not to delay. The fee of fifty dollars must accompany application.

Dr. Hall will remain for the following week, giving an advanced course for those who have taken the first course. The fee for the advanced work will be twenty-five dollars.

Address all communications to A. E. Mimmack, D.D.S., President, 528 Elmwood avenue, Buffalo, N. Y.

No Place Like Home

Little Jimmy went with his mother to visit an aunt in the country, and his mother was very worried as to how he would behave.

But to her surprise he was angelic during the whole visit—always did as he was told and never misbehaved.

As soon as he got home, however, he was his natural self again.

"Oh, Jimmy," she said, "you were so good while you were away. Why do you start behaving badly now?"

"What's home for?" asked Jimmy, in pained surprise.—*Chicago News.*

EDITORIAL

DENTISTRY AND MEDICINE DRAWING CLOSER TOGETHER

Some time ago there appeared an editorial on the above subject in *Clinical Medicine,* and to give our readers this medical viewpoint, I will quote a portion of that article:

"While it is true that dentistry was born outside the ancestry of medicine, yet, as a modern science, it could not avoid affiliation with and adoption into the family of medical sciences; and it was, indeed, under this prestige and these auspices that it has established its claim as an independent professional vocation.

"The hour has now well-nigh arrived, if it has not already struck, for the breaking down of all artificial barriers, and the consummation of a complete kinship between the two. So much of the life-blood of medicine has, in the past few years, flowed into dentistry, and so much of the vital essence of dentistry has been incorporated into medicine, that the relationship between them may now be regarded as a blood relationship. Never was the time more propitious for the cultivation of a broad science of stomatology, in which both medicine and dentistry should pool their respective interests; and never were both medical and dental professions more fertile for its cultivation.

"The dental field, in particular, has undergone wonderful changes in this respect in the last comparatively short period of time, almost within the last five or six years. The great modern doctrines of systemic infection, of autotoxosis, and of biologic pathology, have overshadowed the purely mechanical viewpoint which for a time threatened to stultify dentistry, and have led it out into the broader domains of etiology and prophylaxis. It no longer suffices the intelligent dentist to know the influence of defective teeth upon digestion; he seeks to know something about the influence of defective metabolism upon the teeth. Most of the dentists of the modern school are nowadays making use of physiologic laboratory and clinical diagnostics, such as the urine analysis, the Wassermann reaction, and the like, for an interpretation of dental conditions; and are reinforcing their local treatment of the teeth and mouth with internal, systemic remedies, and prophylactic measures.

"A conspicuous example of this attitude of modern dentistry toward the etiologic and pathologic doctrines of modern medical science is seen in the recent investigations, conducted jointly by dentistry and medicine, upon the subject of pyorrhea alveolaris." * * * * * * *

"The truth is, that in the course of their steady advance, the lines of medicine and dentistry have drawn closer and closer together, until they are now in contact along the entire flank, and henceforth they must campaign as two wings of one army.

"Abandoning all figures of speech, and speaking in plain language, the time has come for closer cooperation between the physician and the dentist. There is no longer the sharply drawn line of distinction between them that there was formerly. Their work and their interests overlap at a thousand points. The dentist must from now on be more of a physician, and the physician must be more of a dentist, and both must be oral hygienists and prophylactors. If physicians and dentists themselves do not realize this, the public does, and will force them into cooperation. You cannot keep the public out of professional confidence any more; and it is a splendid thing, both for public and for profession, that you cannot." * * * *

"But I am sure that the medical and dental professions do not need to be told of their duties and privileges by the public. They realize them and will meet them, as they have always done. Neither one of us, physician nor dentist, can cope with the tasks before us alone. Each of us needs the other. We are, as I have intimated, wings of the same army, and, for the best results, must cooperate, consult together, hold up each other's hands, exchange each other's viewpoints, work side by side. The physician must call the dentist in consultation, and the dentist the physician, and both must take the public into their confidence.

Here is a big field for missionary and organization work, not on the basis of sentiment, but of genuine, practical, progressive efficiency."

A message like this from the medical profession ought to set dentists to thinking and bring them to a realization that the demands on a dentist are more than for reparative work. And yet the great majority of dentists seem content to devote their entire time to repair of the teeth, as a shoemaker repairs shoes. Do they not recognize the scope of greater dentistry, do they not feel prepared to cope with it, are they inconsiderate of the best interests of their patients, or are they simply content to stay within the narrow confines of dentistry of the past?

Some of our leading dentists are advancing with dentistry having recognized the needs of the future dentist and fitted themselves for diagnosis of diseased conditions of the human economy, other than those of the teeth. So long as diseased conditions of the teeth directly or indirectly may cause organic and other diseases in various parts of the body, it is essential that dentists should be able to make a diagnosis first, of the disease itself and then a diagnosis as to whether it is being caused by disease of the teeth. And while diseased conditions of the teeth may affect various other parts of the system, it is also true that diseased conditions in other parts of the body may affect the teeth, and these conditions the dentist should be able to diagnose. He must then, become a diagnostician to be able to cope with these conditions, whether in his practice or in consultation with the physician.

Progressive dentists also are giving attention to preventive dentistry, particularly for children, and looking after the welfare of the little patients. They are not only giving regular prophylactic treatment for prevention of caries of the teeth and other maladies that so often follow, but are looking into conditions of malnutrition, dealing with the metabolism of the body, and prescribing diets for the betterment of the child's physical and dental development, and this is begun at an early age.

As the physician specializing in children's diseases keeps constant watch of his little patients, administering to their needs and becoming guardian over their health, so the dentist of the future must have surveillance over the children and be able to treat them internally, externally and eternally, according to their needs for their best physical and dental welfare, if he does his full duty to humanity through the rising generations.

Things to Forget

If you should see a tall fellow ahead of a crowd,
A leader of men, marching fearless and proud,
And you know of a tale whose mere telling aloud
Would cause his proud head to be shamefully bowed,
It's a pretty good plan to forget it.

If you know of a skeleton hidden away
In a closet, and guarded, and kept from the day
In the dark, and whose showing, whose sudden display,
Would cause grief and sharp sorrow and lifelong dismay,
It is a pretty good plan to forget it.

If you know of a thing that will darken the joy
Of a man or a woman, a girl or a boy,
That will wipe out a smile, or the least way annoy
A fellow, or cause any gladness to cloy,
It's a pretty good plan to forget it.

—*Anonymous*

OHIO STATE SOCIETY

Notice to Members: Copies of the revised Constitution and By-Laws of the Ohio State Dental Society have been sent the Secretary of each Component Society in number sufficient to supply each member with a copy. Ask your secretary for one.

F. R. Chapman, *Secretary.*

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The Component Societies of the Ohio State Dental Society

(This list of Officers is compiled from information furnished by the Secretaries of the various Components; where incorrect it is due to lack of information relative to elections. Secretaries are requested to keep the list correct by notifying the secretary of the State Society or the Editor of The Dental Summary of the result of elections.)

22 Butler County Dental Society, meets 3d Friday. each month.—Pres., P. A. Krucker, Hamilton, V. Pres., E. E. Meisterhaus; Sec.-Treas., F. T. Craven, Hamilton.

10 Central Ohio Dental Society, meets 1st Wed., Feb., May and Oct.—Pres., F. P. Leonard, Bucyrus; V. Prests., J. Pfanstiel and R. C. Bratten; Rec. Sec., L. T. McKinney; Cor. Sec., C. S. Delashmutt, Bucyrus; Treas., F. C. McCaughy.

27 Cincinnati Dental Society, meets 3d Friday. Pres., Wilson Foster, 22 W. 7th St.; V. Pres., Paul Cassidy; Rec. Sec., C. H. Stricker; Cor. Sec., D. A. Leahy, 904 Union Central Bldg.; Treas., J. D. Gordon

6 Cleveland Dental Society, meets 1st. Monday, Pres., W. S. Sykes, 3794 W. 25th St.; V.Pres. S. F. M. Hirsch; Rec. Sec'y, C. T. Story; Cor. Sec'y, F. M. Casto, 458 Rose Bldg.; Treas. J. L. Meikle.

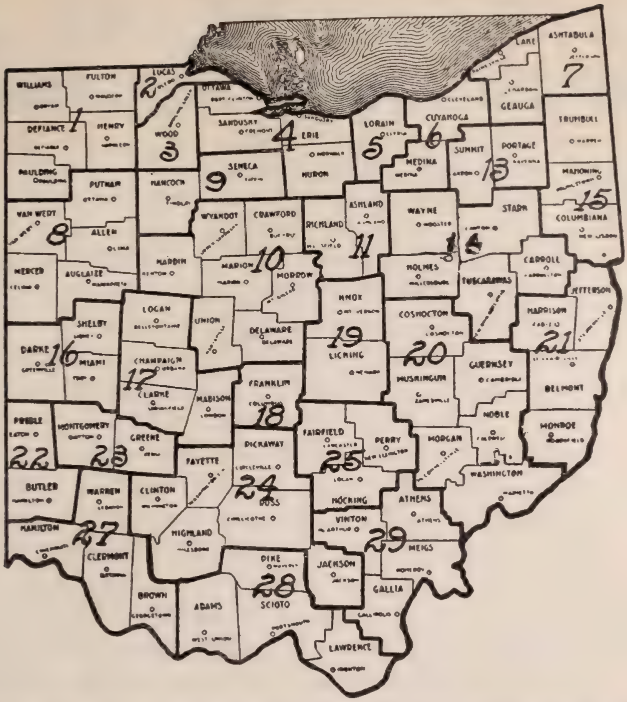
18 Columbus Dental Society, meets last Tuesday, Pres., D. P. Snyder; V. Pres., F. L. Gruber; Rec. Sec., E. N. Hoopman; Cor. Sec., F. C. Starr; Treas., A. O. Ross.

15 Corydon Palmer Dental Society, meets 2d Thursday, April and Oct.—Pres., J. F. Steele, Lisbon; V. Presidents, T. J. Evans, J. H. Chessrown and G. L. Moore; Rec. Sec., J. T. Williamson; Cor. Sec., W. B. Challis, Lisbon; Treas., J. K. Nash.

21 Eastern Ohio Dental Society, meets 1st Thursday, May and October—Pres., C. S. Starkweather, Bellaire; First V. Pres, L. B. Peterson, Steubenville; Second V. Pres., George Sharp, Flushing; Cor. Sec., J. K. Hunter, Bridgeport; Rec. Sec., H. A. Smith, Steubenville; Treas., S. C. Hasbronck, Barnesville.

9 Hancock - Seneca Counties Dental Society, meets 2d Wednesday.—Pres., A. C. Cole, Fostoria, V. Pres., ———; Rec. Sec., E. V. Burns, Findlay; Cor. Sec., A. E. Mann, Findlay; Treas., V. H. Michener.

25 Hocking Valley Dental Society, meets 1st Monday.—Pres., J. J. Stukey; Vice Pres'ts., C.F.Acker; and W. M. Scott; Sec., R. H. Wetzel, Lancaster, Treas., J. A. Rockey.



5 **Lorain County Dental Society**, meets 1st Tuesday, Feb., Apr., Sep. and Nov. Pres., F. A. Newhall, Lorain; V. Pres., C. J. Love; Sec., J. G. Wherry, Elyria; Treas., J. E. Trombley.

17 **Mad River Valley Dental Society**, meets 2d Monday, bi-monthly.—Pres., E. Dibert, Springfield; Vice Presidents., A. E. Bible and H. Houser; Rec. Sec., H. H. Krapp; Cor. Sec. W. B. Seward; Treas., E. V. M. Thompson.

1 **Maumee Valley Dental Society**, meets 2d Tuesday, June and Oct.—Pres., N. A. Cunningham, Defiance; V. Pres., A. S. Blake; Rec. Sec., S. D. Potter; Cor. Sec., O. J. Wisman, Delta; Treas., J. A. Benner.

23 **Miami Valley Dental Society** meets last Monday. Pres. H. L. Oliver, 1020 Fidelity Bldg. Dayton. V.Pres. F. W. Cockerill; Rec. Sec'y. W. G. McBain; Cor. Sec'y. H. M. Brewer, 816 Harvard Blvd. Dayton; Treas. J. R. Arthur.

20 **The Muskingum Valley Dental Society** meets second Thursday, Jan., May and Sept.—Pres., P. F. Walker, Coshocton; V. Prests., A. W. Boyd and T. E. Axline; Sec., J. A. Honabarger, Warsaw; Treas., H. J. Boyd.

4 **North Central Ohio Dental Society**, meets 3d Wednesday, Jan. Apr., July and Oct.—Pres., A. G. Thatcher, Fremont; Pres. Elect., E. S. Braithwaite, Willard; Vice-Pres., H. S. Rogers, Sandusky; Rec. Sec., D. D, Smith; Cor. Sec. J. H. Billmeyer, Norwalk; Treas., L. F. Meyer.

7 **Northeastern Ohio Dental Society**, meets 2d Monday —Pres., H. O. Frederick, Ashtabula; V. Pres., O. T. Battles; Sec., R. J. Goggin, Ashtabula Harbor; Treas., R. J. Goggin.

8 **Northwestern Dental Society**, meets 4th Wed. Pres. G. K. Tolford, Lima; V.Pres. I. W. Basinger and J. M. Hurlburt; Rec. Sec'y. H. M. Crawford; Cor. Sec'y. J. W. Dimond, Lima; Treas. M. O. Van Stronder.

29 **Ohio Valley Dental Society**, meets 2d Wednesday, Apr and Oct —Pres. M. D. Hartinger, Pomeroy; V. Pres., R. B. Church; Sec., C. S. Shumaker, Pomeroy; Treas., J. B. Hodge, Middleport.

24 **Rehwinkel Dental Society**, meets 3d Thursday. Pres., A. M, Bush; V. Pres., O. A. Thompson; V. Pres., C. H. Martin; Sec,, F. D. Wollard, Washington, C.H.; Treas., C. V. Laam.

11 **Richland-Ashland Counties Dental Society**, Meets last Monday. Feb.. June and Oct.—Pres., B. W. Livingston, Ashland; V. Pres., J. H. West-Rec. Sec., I. R. Suter; Cor. Sec., J. F. Clark, Mansfield; Treas., E. F. Cleland.

28 **Southern Ohio Dental Society**, meets, 3d Mon; day. May and Oct.—Pres.,W. H. Johnson, Waverly-V. Pres., A. S. Adams; Sec., C. E. Beatty, Portsmouth; Treas., E. O. Buchanan.

12 **Stark County Dental Society**, meets 3rd Wed. Pres. C. O. Carr, Canton; Pres.-Elect H. E. Deal; V. Prests. J. G. Foltz and O. B. Pfouts; Rec. Sec'y. M. M. Rubright; Cor. Sec'y. M. F. Gruber, Canton; Treas. M. F. Gruber.

13 **Summit County Dental Society**, meets 1st Friday. Pres., J. T. Connors, Akron; V. Pres.,———- Rec. Sec., H. G. Haas; Cor. Sec., F. S. Butler, 2d Nat. Bank Bldg., Akron; Treas., A. S. Butler.

2 **Toledo Dental Society**, meets 3d Friday. Pres., T. S. Shaw; V. Pres., H. W. Hisey; Sec., L. C. Jackson, 2205 Ashland Ave.. Treas., C. H. Cox.

30 **Tuscarawas County Dental Society** (a new society) meets 2d Tuesday. Pres. A. W. Davis, Dover; V. Pres., F. H. Waldron; Sec. and Treas., E. S. Wagner, Dover.

16 **Western Ohio Dental Society**, meets 1st Thursday, Feb., May and Oct.,—Pres. F. A. Clear, Greenville; V.Prests. H. A. Lightner, C. C. Fink and O. F. Sickman; Sec'y and Treas. F. A. McCullough, Troy.

3 **Wood County Dental Society**, meets 2d Wednesday.—Pres., B. D. Roe. Bowling Green; V. Pres., R. E. Milbourn; Sec., T. M. Lea, Bowling Green; Treas., E. R. Beatty.

19 **W. D. Miller Dental Society**, meets 2d Thursday. May and Oct.—Pres.,W. S. Deely. Mt.Vernon; V. Pres,, H. S. Barrick; Rec. Sec., L. E. Davis; Cor. Sec., E.V. Prior, Newark; Treas., W. B. Grossman.

SUGGESTIONS

Conducted by F. R. Chapman, M.S., D.D.S., Columbus, Ohio

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

A Protective Tip for Steele's Facings

Select Steele's Facing, grind off incisal edge of facing. With a knife-edge stone, finish cutting slot in facing through the incisal edge, to enable facing to slip off of backing gingivally. Place facing on backing and build up incisal edge with inlay wax, set sprue, remove facing gingivally, invest, cast, replace facing, articulate, remove facing gingivally, invest, solder bridge, cement facings to place, set bridge.

Advantages—24K protective tip eliminates checking; more perfect adaptation between protective tip and facing; more sanitary. No secretions between facing and protective tip facing and backing, (such as are always found present in pin-tooth bridges). No dark line between protective tip and facing, (such as are found in pin-tooth protective tip methods, caused by imperfect adaptation, solder and secretions). More perfectly built and *contoured* protective tip. Minimum loss of gold in the finishing. Inlay effects.

Note.—Richmond Crowns may be neatly made by this method, by soldering the lingual with facing *in situ*, with little or no danger of checkin the facing.—*D. R. Parsons, D.D.S.*, Huntington, W. Va.

To Confine Solder to One Spot

Paint the parts to be protected with yellow ochre water-color. Whiting will work the same way, but flakes off when heat is applied, which is not the case with the yellow ochre.—*Oral Health.*

Removal of Facings

It sometimes becomes necessary to again solder on the work after the facings have been cemented to place. This may be done after the facings have been removed. Place the bridge over night in concentrated ammonia water. It will combine with the phosphoric acid and the cement will disintegrate.—*F. W. F., Pacific Dental Gazette.*

Painless Removal of Enamel

Place a short piece of rubber tubing or small rubber band around the neck of the tooth well up on the gum and leave it over night so that the gum will be pressed back. The enamel may then be removed quite painlessly without causing the gum to bleed.—*H. Hartman, Dominion Dental Journal.*

Sensitive Dentin

A special remedy is a combination of chloroform, ether and menthol, applied with a hot-air syringe. This has seldom failed, even in the most extreme cases, it makes the operation at least bearable.—*Oral Health.*

A Useful Method of Locating Small Root Canals

A pellet of absorbent cotton is dipped into a four per cent. solution of sulphuric acid and placed into the pulp chamber for a minute. Remove the pellet and neutralize the acid with sodium bicarbonate. The cavity is then syringed with warm water and dried. Another pellet of cotton is dipped in tincture of iodin and inserted into the cavity for a minute. Upon removing the pellet black spots will indicate the orifice of canals. —*E. P. Bateman,* Katoomba, N. S. W., *Commonwealth Dental Review.*

Cotton Rolls

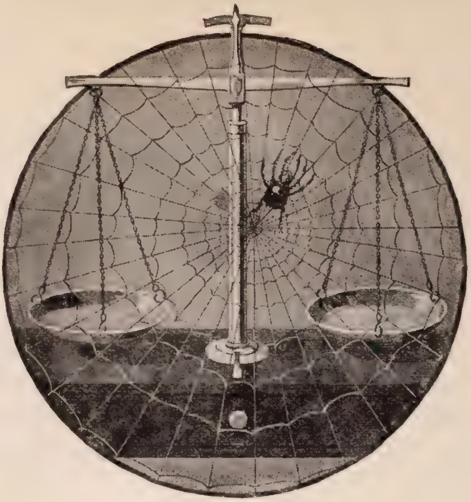
It has been the practice to place the cotton rolls horizontally, or parallel with the line of occlusion and in the buccal space. But if a stiff cotton roll (large one) about two and one-half to three inches long (the ordinary six-inch roll cut in half) be placed perpendicularly in the mouth, say from the upper first molar to the lower first molar, you have a natural brace keeping the buccal walls distended, and with the saliva ejector you have a perfectly dry field. Also you have a very effective but gentle means of holding the mouth open.—*R. W. Burch, Dental Cosmos.*

Conservatism in Extracting

I agree with those who advise the extraction of dead and diseased teeth after a thorough attempt to effect a cure has failed or is doubtful. It is more than likely that seventy-five per cent. of the shadows in the roentgenograms at the apical ends of the teeth have been caused by irritation from mechanical treatment and the use of drugs in dental operations, and hence these teeth are removed unjustifiably. I have seen teeth that Roentgen-ray examination indicated were abscessed—as some men would say—remain fifteen years or longer without any symptom of disease, local or general.—*Wm. M. Fine, A.M.A., Journal* per *Dental Register.*

A Natural Gum Pink

Many efforts are being made to esthelize the vulcanite denture. Some methods are better than others, many have weaknesses. I have found the following a desirable and quite satisfactory method: Take a strip one-eighth inch wide from a sheet of light, medium and dark pink, then a strip one-fourth of an inch wide from a sheet of Gould's gum pink, twist these into a rope and cut from it such pieces as you desire for packing. In some cases I find that a sixteenth of an inch strip of light orange may be added to the above with fine results. This method makes a stronger cast.—*F. W. F., Pacific Dental Gazette.*



Cobwebs

WHAT has become of all the alloys that used to be "balanced in every batch"? The same alloys continue to be made, but cobwebs cover the "balances."

The fact is that the alloys are better than their advertised theory was. Dentistry is beyond the stage of the empirical. Known quantities, definite processes—precision—these are now demanded, and thus the results are predetermined. In the introduction of

Ney-Aloy

over three years ago, a new era in alloy making and advertising was inaugurated. To our way of thinking there is still need of progress.

And the end is not yet

1 oz. $2.25; 5 ozs. $10.00

IF YOUR DEALER CANNOT SUPPLY ANY ARTICLE OF OUR MANUFACTURE, WRITE TO US

THE PIONEER
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NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

That plans for the disbursement of $46,000,000 recently appropriated by Congress for the medical treatment and hospitalization of disabled ex-service men, the fund to be administered through the Bureau of War Risk Insurance, are nearing completion, is announced by Director R. G. Cholmeley-Jones.

The item in the Sundry Civil Bill which caries this appropriation reads in part as follows:

> "Medical and Hospital Services: For medical, surgical, and hospital services, medical examinations, funeral expenses, traveling expenses, and supplies, for beneficiaries of the Bureau of War Risk Insurance, including court costs and other expenses incident to proceedings heretofore or hereafter taken for commitment of mentally incompetent persons to hospitals for the care and treatment of the insane, $46,000,000. This appropriation shall be disbursed by the Bureau of War Risk Insurance and such portion thereof as may be necessary shall be allotted from time to time to the Public Health Service, the Board of Managers of the National Homes for Disabled Volunteer Soldiers, and the War and Navy Departments, and transferred to their credit for disbursement by them for the purpose set forth in this paragraph. The allotments to the said Board of Managers shall also include such sums as may be necessary to alter or improve existing facilities in the several branches under its jurisdiction, so as to provide adequate accommodations for such beneficiaries of the Bureau of War Risk Insurance as may be committed to its care."

As a first step in carrying out the provisions of this appropriation, which became effective July 1, 1920, an examination was conducted as to the availability of certain National Homes for Disabled Volunteer Soldiers, which have been established throughout the country.

Later, at a conference between General Wood, president of the Board of Managers of the National Homes for Disabled Volunteer Soldiers, Doctor Salmon, representing the Mental Hygiene Committee of the Rockefeller Foundation, Doctor Pattison, representing the National Tuberculosis Association, and R. G. Cholmeley-Jones, director of the Bureau of War Risk Insurance, it was decided to convert two of the National Homes into sanatoriums for the exclusive treatment of tuberculosis and one of the Homes into a sanatorium for the exclusive treatment of mental cases. Each of the tuberculosis sanatoriums is being equipped to care for one thousand hospital patients, and the sanatorium for the treatment of mental cases will also accommodate one thousand cases.

At the present time there are approximately 17,625 War Risk patients in hospitals; 7,980 of whom are in U. S. Public Health Service Hospitals and 9,645 in hospitals and other institutions not owned or operated by the government. Some nine hundred hospitals in the United States are now included in the list of those housing War Risk patients, the number of patients assigned to each hospital ranging from one to several hundred.

If the number of patients continues to increase at the present rate, by the end of the fiscal year there will be approximately thirty thousand War Risk patients in hospitals.

Those patients who have become disabled by reason of their military or naval service and who are, therefore, provided for under the War Risk Act, are classified in three divisions, as surgical and general, as tuberculous and as mental cases. The difficulties to be coped with in the treatment and care of mental cases exceed those to be encountered in the care of tubercular patients, who in turn must be given the specialized treatment necessary to combat that disease, and the proper segregation of patients in these classes, as well as the surgical and general patients, is to be accomplished only in hospitals owned and operated by the government. It is designed that the sanatorium for the treatment of mental cases which is being organized, through the administration of the War Risk appropriation, shall become the leading institution of its kind in America, and that the two sanatoriums to be devoted exclusively to the care and treatment of tuberculosis patients shall be of the highest type in construction and equipment.

By securing the existing hospital facilities of the war and navy departments and the national homes for disabled volunteer soldiers there will be available in the army hospitals approximately four thousand beds, in the navy department approximately four thousand beds, and in the national homes for disabled volunteer soldiers approximately six thousand beds. These, together with the approximately fifteen thousand hospital beds of the U. S. Public Health Service, which are already available or are to be made available, will aggregate approximately twenty-nine thousand beds in hospitals owned and operated by the government.

Much is still to be accomplished in order to carry out the program before the Bureau of War Risk covering the fiscal year 1290-1921 and provided for under this appropriation, for the care and treatment of all those who have become War Risk patients by reason of their military service during the recent world war.

There is an exceptional opportunity awaiting a young, ambitious dentist in a thriving little town of 1500, surrounded by rich farming district. This office was built especially for a dentist. Has enclosed porch, tiled floors, reception room, operating room. Laboratory located between the operating and extracting room. Fine woodwork and hard wood floors throughout. Gas, electricity, water and heated with hot air furnace located in basement. Fitted throughout with the latest and improved dental fixtures.

The reason for selling is death of Doctor owning this office. This Doctor had an enviable reputation for good dentistry. Had no competition and since the writer's early school days can remember it was mighty hard to get an appointment. This dentist did work for the writer for fully twenty years and it is as good today and still holding up.

If some young dentist who means to rise in his chosen profession can follow in the footsteps of this Doctor, a fortune awaits him. Really, Doctor, opportunities like this come once in a lifetime.

If interested, address Mrs. May Rounds, Box 62, Dunkirk, Ohio for particulars.

National prohibition is having a decidedly beneficial effect upon the soft tissues of the mouth. Gums, as a rule, do not exhibit the softness and tendency to inflammation so prevalent in tipplers. This fact has been noted and commented upon by several dentists.

Dr. John P. Carmichael will soon visit Toledo and Cleveland for the purpose of conducting classes in bridgework and prophylaxis. Toledo dentists who have taken his courses speak in terms of highest praise of his technic and method of teaching. Those interested may secure information by addressing The Ransom & Randolph Co., Toledo, or Cleveland.

Material that has been running in THE SUMMARY during the present year, from the pen of Dr. W. H. O. McGehee, director Western Reserve University is to form a part of a book to be issued early in the fall, under the title "Fundamentals of Operative Dentistry," which is sure to become a distinct and distinctive part of dental literature. Dr. McGehee has gone into his manifold subject with painstaking care and a thoroughness of which few men are capable. The book will carry a wealth of illustrations, most of them designed and produced especially for this work. The Ransom & Randolph Co. is publishing the work, and it will appear in a dress befitting its monumental character.

Two portable clinics are to begin operation on the opening of the Portland, Ore., schools in September.

The Northern Indiana Dental Association is to meet at Marion, on October 6 and 7. Drs. Priest and Hiatt have the local arrangements in charge which means success from soup to nuts.

Dr. F. G. Rummel, Piqua, was chosen treasurer of the Psi Omega fraternity at the Cedar Point meeting, in July; E. A. Biddle, of Urbana, grand master; A. N. Lindsey, secretary; M. A. Bruzelius, Lima, inside guard, and H. M. Seamans, Columbus, editor. The meeting was a splendid one, promising much good to the profession. Dr. H. Leon Williams made the statement that the world was on the eve of stupendous discoveries, which would involve the "harnessing of a force so great as to be inconceivable to the ordinary person." Just so. As Carlyle says: "We are living in the midst of immensities," and the pity of it is that so few people have a single idea of what they are, preferring to live the life of indolence, with hardly a thought above that of an oyster.

When the Worcester, Mass., schools open for the fall session, six free clinics will be ready to take care of the teeth of the children. The time is not far distant when every public school equipment shall include a dental clinic quite as a matter of course.

Societies made up of dental assistants are being formed in various localities from West Virginia to the Pacific. Good business.

Fifteen hundred dentists attended the Washington and British Columbia Association, at Tacoma, July 11. Interest in society meetings never was so great or so intelligent as now.

The Rochester Dispensary began late in July to perform tonsil and adenoid operations at the rate of forty per day, in preparation for the fall opening of school. This will give some idea of the prevalence of these troubles.

Dr. Jesse Cope Green, West Chester, Pa., whose recent death is announced elsewhere in this issue, was the only centenarian mentioned in "*Who's Who in America.*" He was known as "the grand old man" of West Chester. He was very well known outside of the profession—as the inventor and patentee of an improvement in the telescope, now in use throughout the world. He was treasurer of a volunteer fire company for sixty-six years, and within the last year of his life helped to fight several fires. He was a great walker and bicycle rider, and believed that exercise, plain living and interest in athletics generally had much to do with his long and active life. His only serious illness was an attack of pneumonia a few years ago, from which he recovered within two weeks. He was a collector of coins, rare letters, autographs, books and manuscripts. For many years he was the official weather observer for his town, and owned one of the latest and most complete outfits for that work.

He was one of the original members of the Pennsylvania Association of Dental Surgeons, formed in 1855, and was later treasurer and afterwards president of the organization for a time. He was one of the active spirits in the formation of the association and assisted in the arrangements for the first national convention of dentists, which was held in Philadelphia, in 1855.

He was also a leading member of the Chester County Historical Society and other organizations in which he had taken a deep interest.

Carmi Lustro Polishing Powder

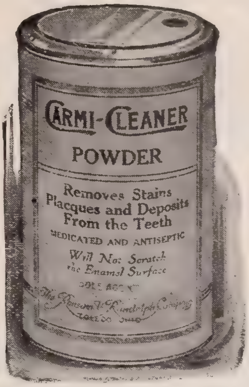
A medicated antiseptic, non-abrasive Polishing Powder, the first material ever offered for restoring the brilliancy to tooth enamel, no matter how lost.

Polishes Without Wearing

Works by friction, not by abrasion. Restores highest brilliancy without injury to teeth.

Prices in U.S.A., Effective July, 1919, Small size, $0.65 Large size, $1.25 Subject to change without notice.

Use Carmi Cleaner, powder and paste for cleaning teeth; Carmi Lustro for restoring natural polish.


CARMI-CLEANER
POWDER
Removes Stains Placques and Deposits From the Teeth
MEDICATED AND ANTISEPTIC
Will Not Scratch the Enamel Surface
SOLE AGENT
The Ransom & Randolph Company
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Carmi Cleaner Powder

A medicated antiseptic Cleaning Powder, in successful use for many years. Quickly removes infectious matter and all stains, leaving a smooth, unabraided surface, ready for polishing.

For Home Treatment

In Pyorrhea, should be dispensed by dentist for use three times daily for several days before scaling. Frees teeth and gums from clinging, putrescent debris, which is thrown out when mouth is rinsed. Ideal for cleaning artificial dentures.

Prices in U. S. A., effective July, 1919, subject to change without notice. Small size $0.65, Large 7 oz. size, $1.25 3 pound can, $6.00.

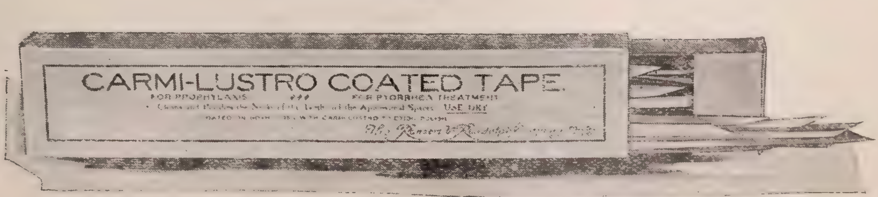
A Cleaner—not a Polish. Use Carmi Lustro Polishing Powder for restoring luster to enamel.

PREPARED
Cork Polishing Wheels
Specially adapted and very effective for use with
CARMI LUSTRO
SOLE AGENT
The Ransom & Randolph Company
TOLEDO OHIO
Directions on bottom of Box

Cork Polishing Wheels

Designed for and best adapted to the use of Carmi Lustro Polishing Powder. The powder adheres well. The wheels are of high-grade cork and will be found very durable.

Price, per box of about six dozen $0.65



Especially prepared for cleaning and polishing the necks of the teeth. It is indispensable in prophylactic and pyorrhea treatment. It is an unwoven fibre composition, heavily coated with Carmi Lustro Polishing Powder, which will impart as high a luster as the Carmi Lustro Powder applied with the Cork Wheel. Ends are pointed to allow easy passage between the teeth.

A valuable unit in the Carmi Lustro Outfit. Price, in U.S.A., in effect July, 1919, per box, $0.65.

Order from your dealer. New literature free on request

The Ransom & Randolph Company
TOLEDO, O. U. S. A.
CLEVELAND GRAND RAPIDS FLINT COLUMBUS

So many things are happening in dentistry just now that are of most intense interest that the merest mention of all of them would fill THE SUMMARY every month. This surely is a great age—and yet there are some dentists who still contend that a dollar is an overcharge for alloy fillings! Gosh! They are still in their toddling infancy.

Heard of a dentist the other day who was suffering from endarteritis obliterans. Don't know what it is, but it sounds mighty nice and high-toned and expensive and all that; very exclusive, too, thanks. Well, I'd rather have infantile colic. My voice is still strong.

Maryland attorney general recommends cancellation of license and refusal of registration and the right to practice of all dentists who display signs or in any other way advertise "painless" dentistry. He declares that there is no such thing—and he probably knows.

The Miami Valley hospital at Dayton, Ohio, is to add a high-grade and complete dental clinic.

The Detroit Board of Health has started a crusade against illegal practitioners. One man, an ex-whiskey salesman, said to own several "dental parlors," operating illegally, was arrested July 16, and other arrests are promised.

The registrar of Vanderbilt school of dentistry reports an increase of three hundred per cent. in applications for enrollment for the coming session, despite the rigid requirements now in force. Vanderbilt has been given a Class A rating, and requires at least two years' college work prior to admittance. It is thought that it may become necessary to limit the Freshman class for '21.

A Daring Voyage

Ft. Wayne, Aug. 10.—Trained in the rudiments of navigation on the waters of Clear Lake and the Maumee river, William Washburn Nutting, former Fort Wayne boy, the nephew of our friend and co-worker Dr. E. W. Dodez, of Fort Wayne, of recent years a motor boat and yachting enthusiast and editor of "*Motor Boat*," is believed to have hung up a new world's record for a trans-Atlantic voyage in a forty-five foot craft, when he piloted his ketch "Typhoon" into the harbor at Cowes, Isle of Wight, Monday morning. The game little boat made the hazardous non-stop run from Cape Race, New Foundland, to Bishop's Rock, Scilly Islands, a distance of 2,108 miles, in the record time of fifteen days and nine hours.

The craft left Cape Race, July 24, with a distinguished crew aboard her. Besides Nutting there were F. W. Baldwin, the head of Dr. Alexander Graham Bell's laboratories in Canada, where the boat was built; Jim Dorsett, Baldwin's right-hand man, and Guy Matheson, who won distinction during the war for having joined the Canadian expeditionary forces as a private and coming back an acting colonel, possessing, it is said, every military decoration within the gift of the British nation to bestow except the V. C.

As was his desire, Mr. Nutting and his party arrived just in time to attend the races for the British International Trophy, for which an American team of three boats has challenged and which began today. Before returning the Typhoon will cruise about the British Isles and down the French coast into the Mediteranean. The party will sail for the United States this fall, stopping at the Azores and Bermuda.

The Easiest Way

A gynecologist was speaking. "No," he said, "I haven't taken out a permit. In twenty years of practice I have yet to find a case in which I could be sure whisky was beneficial. Not having a permit makes it easy for me to turn down requests from my intimate friends and patients." Then the opinions of a well-known internist, a pediatrician, a surgeon, and some general practitioners were sought. None of them, with the exception of one of the latter, had taken out a permit. He had given ten prescriptions in three months, and he admitted—not for publication—that in nine instances the prescription was written at the patient's request, and in the tenth something else would have served. Don't subject yourself to temptation; don't hurt the feelings of your patient or of a very particular friend by refusing to write a "prescription" when he pleads for one. Have a good excuse for not doing so. The easiest way is not to have a "permit," much less a book of blank prescriptions.—*Jour. Am. Med. Assn., Editorial.*

Deaths

At Michigan City, Ind., July 15, Dr. Vernon Landon, aged 65.

At Kilbourn, Wis., July 15, Dr. Frank H. Kesler, aged 63.

At New York, July 16, Dr. Edward Neve, of Tampa, Fla., aged about 70. He was one of the largest land-owners in southern Florida.

At Seymour, Ind., July 17, Dr. C. L. Cope, aged 29, was killed by coming into contact with a high-voltage wire on an X-ray machine. He was about to take a photograph of a patient's mouth. His body was thrown about ten feet. Death was instantaneous.

At West Chester, Pa., July 27, Dr. Jesse Cope Green, aged 102 years and seven months, from internal injuries received when he fell from a step-ladder in his library ten days previous to his death, when re-arranging some of his books. He rode a bicycle daily up to the time of his injury, and was a thorough believer in exercise as a promoter of longevity. He retired from practice in 1909, at the age of 92.

At Little Rock, Ark., July 24, Dr. T. Y. Cooper, aged 63. He had been ill for four years.

At Poland, N. Y., July 27, Dr. Jerome L. Seavey, aged 81.

At Nashville, Tenn., July 21, Dr. R. M. Bogle dropped dead on the way to his office, of heart failure, aged 73. He was in the best of health, seemingly, talking and laughing with friends, when the end came instantly.

At Brooklyn, August 2, Dr. Burton Talmage, aged 50; suicide by inhaling gas; poor health is assigned as the cause.

At his home in Paris, France, July 24, Dr. William J. Younger, formerly a prominent and well known dentist of San Francisco, aged 80. He was known as a discoverer and inventor along dental lines.

At Brooklyn, N. Y., July 29, Dr. Albert Henry Stevenson, aged 36. Dr. Stevenson was recently appointed full professor of preventive

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4¾ inches from top of Glass Rack to bottom of Jar.

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dentistry at the School of Dentists in Columbia University and conceded to be the second most eminent authority in the United States on oral hygiene. Dr. Stevenson's death was the result of an attack of cerebral meningitis.

The hygienist was well-known as a propagandist, was instrumental not only in the passing of the law six years ago which required an oral hygienist to have at least one year's high school training but was also a factor in the recent modification of the law which called for the completion of a high school course. He returned a week ago from a lecture tour to Boston, Chicago and Minneapolis in the interest of similar laws when he was seized with the illness from which he never recovered. He was instrumental in securing legislation along this line for Pennsylvania.

Dr. Stevenson was born in Brooklyn and with the exception of the last year of his life, when he resided in Bronxville, N. Y., spent all his life there.

After his graduation with the degree of D. D.S. from the New York College of Dentistry in 1906 when he was twenty-two years old, he engaged in active practice for ten years.

Early in his career Dr. Stevenson became actively interested in oral surgery and began giving lectures on that phase of dentistry in the public schools and settlement houses. About four years ago he was elected president of the Second District Dental Society. He also is a member of the State and National Dental Societies.

At Brooklyn, N. Y., August 31, Dr. Charles D. Guarini, a veteran of the world war.

At San Francisco, July 31, Dr. Richard Henry Kimball, of Chicago.

At Plainfield, N. J., July 10, Dr. Charles R. Thiers, aged 71.

At Boston, July 16, Dr. William P. Hurley.

Dr. H. A. Benson

Resolutions passed by the North Central Dental Association:

Whereas, by the hand of an assassin, our fellow member, Dr. H. A. Benson was, on November 25, 1919, suddenly stricken, we, the members of the North Central Dental Society, wish publicly to express our deep sorrow at the untimely death of our friend and associate, and to that end have passed the following resolutions:

Resolved, that in the death of Dr. H. A. Benson, we feel the loss of a valued and esteemed member, who always stood for the best there was in dentistry.

Resolved, that our warmest sympathy be extended to his widow and near of kin in their great bereavement; and be if further Resolved, that a copy of these resolutions be preserved by the society and that his widow be notified of this action.

Committee
Dr. T. S. Seeley, Norwalk, O.
Dr. J. T. Nicholson, Sandusky, O.
Dr. M. H. Stewart, Bellevue, O.

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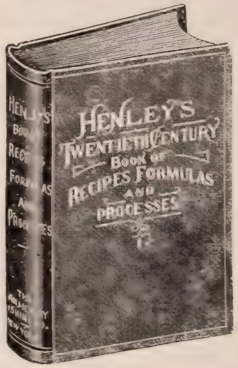

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Ohio—North Central

One of the most enjoyable little trips that it ever has been my good fortune to make was my visit to Sandusky, on Wednesday, July 21, the occasion being the meeting of the North Central component of the State Society, which comprises Erie, Sandusky and Huron Counties. The meeting proper was held at a clubhouse in Sandusky, the name of which sounds like—but isn't—"Sunny Indian." After talks and clinics by Drs. Douglas, Walslagel, Straup, Smith, Miller and others, the meeting with visitors of course, (yes, I know; visitors wives also), adjourned via motor cars, to the Plumb Brook Club for a splendid chicken dinner. During the afternoon the visiting ladies were entertained by the local committee of ladies; Mrs. Dr. Rogers at the head, by a boatride and visit to Cedar Point. We (Mrs. and myself) are greatly indebted to Dr. and Mrs. Meyer, Dr. and Mrs. Rogers, Dr. and Mrs. Peck and the whole royal bunch. We hope to have the invitation repeated.

New Jersey—State

Atlantic City, July 14.—"Americans have the soundest teeth in the world, and are accorded this distinction abroad," declared Dr. John C. Forsythe, of Trenton, president of the New Jersey State Dental Society, addressing the opening session of the golden jubilee convention of that organization on the Million Dollar Pier here today.

Dr. Forsythe, in announcing that the society would continue its crusade against "dental quacks" operating in the state, declared that during the year there had been twenty-three successful prosecutions, and that fines ranging from one hundred dollars for first offenses to five hundred dollars for the second and additional offenses, had been imposed.

Dr. Forsythe declared that the state is now pretty well clear of dental quacks, and urged constant vigilance in the matter.

James I. Woolverton, of Trenton, in submitting the report of the legislative committee, declared that the efforts of the committee were successful in having a bill passed which exempted dentists from jury duty. Frederick Lum, Jr., of Chatham, told the convention that he was happy to report that the committee on infraction of the code of ethics had a clean bill to present.

Officers were elected as follows: President, S. Irving Callahan, Woodstown; vice-president, W. W. Hodges, Newark; treasurer, F. K. Heazelton, Trenton; delegate to the National Dental Society, Frederick Lum, Jr.; board of dental examiners, George S. Grim, A. R. Slade, Frank Clawson, A. Zabriskie, J. B. Stevens and J. B. Goodall.

Oregon—State

Portland, Ore., July 24.—Dr. Clyde Mount, of this city was elected president of the Oregon State Dental Association today.

Other officers elected are: Vice-president, W. D. McMillan, La Grande; treasurer, Fred Gulick, Portland; editor, J. L. Barber, Portland; members of the executive committeee, Lyle A. Baldwin, Portland; L. A. McAloney, Portland; Floyd L. Utter, Salem. Two members of the executive committee, E. C. Robinson and A. F. Weeks, both of Portland, hold over their positions from last year, as does Wallace Shearer of Portland, secretary.

Arkansas—Northwest

Ft. Smith, Ark., July 25.—Officers for the Fort Smith district, Arkansas Dental Association, were elected for the ensuing year at an important meeting Friday night in the office of I. M. Sternberg. Thad W. Kelton was elected president; W. T. Royland, vice-president, and Frank Blakemore, of Van Buren, secretary of the association. Plans were discussed for holding a Northwest Arkansas Dental Association convention in Fort Smith in October. Complete arrangements regarding the convention will be made at an early meeting of the association.

Wisconsin—State

Milwaukee, July 15.—C. W. Hall, Milwaukee, was re-elected president of the Wisconsin Dental Society at the close of its three-day "jubilee meeting" in celebration of its fiftieth birthday. E. C. Oviatt, Columbus, was chosen first vice-president; J. M. Donovan, Neenah, second vice-president; R. W. Huegel, Madison, secretary; Adolph Gropper, Milwaukee, treasurer, and Roy S. Hopkinson, librarian.

H. Edmund Friesell, of Pittsburgh, president of the National Association, was the principal speaker at the "jubilee" banquet in honor of its past presidents at the Hotel Pfister.

C. W. Hall, president of the society, presided. W. H. Cudworth toastmaster. Other speakers included C. N. Johnson, Eugene S. Talbot and Edwin Noyes, Chicago; Edward C. French, Eau Claire; W. H. Clack, Mason City, Ia.; T. A. Hardgrove, Fond du Lac, and R. G. Richter, G. V. I. Brown, E. A. Geilfuss and H. L. Banzhaf, Milwaukee.

Washington—State

Tacoma, Wash., July 18.—Joseph F. Alexander, of Seattle, was elected president of the Washington State Dental Association, Saturday afternoon in the closing business session of a seven-day joint convention with the British Columbia Dental Society.

F. A. Fulton, of Walla Walla, was chosen vice-president and the following were selected to serve three years on the executive committee: Frank Lynott, of Spokane; G. A. Chapman, of Colfax, and Burroughs Mann, of Spokane.

The convention accepted the invitation of the British delegation to hold a joint session in Vancouver, B. C., in 1921.

A sixteen-story building is planned for Kansas City, to be occupied solely by dentists, physicians and other professional men. The idea has been endorsed by both physicians and dentists. The building will include six hundred offices.

Oranges and Lemons for the Teeth

Some new and highly interesting ideas about the treatment of the teeth are set forth by Dr. Albert Westlake, of New York, in the *Medical Record*. Speaking of pyorrhea, he says that a youth from nineteen to twenty-five or a girl of from sixteen to twenty-one years of age, whose gums show a line of redness about the margin, is sure to have that disease within fifteen years unless they follow the vigilant rules of oral and body hygiene.

In his thirty-two years of active practice he has never seen a case of true pyorrhea in which the bowels acted freely and regularly.

After describing his method of operating on

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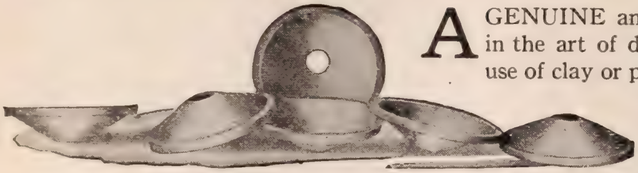


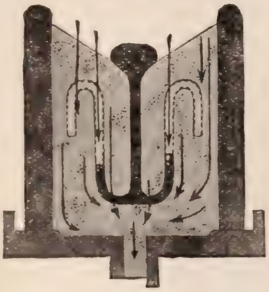
Group of Clay Crucibles

A GENUINE and a very marked improvement in the art of dental casting is effected by the use of clay or porcelain crucibles.

Invested with the pattern they come away easily after the operation is completed, and may be used over and over again.

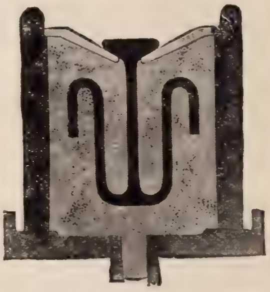
IN the use of casting devices in which steam, gas or air is employed no force is exerted to carry the molton metal laterally or upward, or to hold it while the cooling or congealing process is going forward; hence the metal rises only to the point of balanced forces, as is shown in illustration at the left. By the new method, the exposed top of flask or ring is sealed in with a non-porous clay or porcelain crucible in such manner as to prevent entirely the entrance of air from that point, allowing the metal to rise, following any continuous channel within the mold, the pressure behind carrying it into every nook and cranny formed by the pattern; and that pressure is held after the mold is filled. See cut at the right.

The Old Way



Pressure equalized in the mold, tending to prevent the rise of molten metal.

The Laing-Elgin Way



Downward pressure centralized by clay crucibles. Metal follows channel in mold in all directions

Simple and Definite Technic

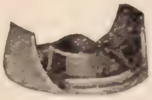


Fig. 1

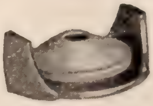


Fig. 2

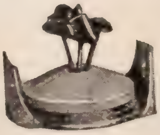


Fig. 3

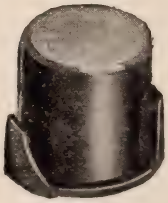


Fig. 4

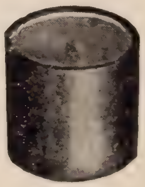


Fig. 5

For Inlays and Small Pieces: A positioning ring (Fig. 1) is fitted with a cup containing a quantity of soft wax. Over this cup is inverted a small crucible (Fig. 2). Sprue wires, having patterns attached, are passed through the opening, into the wax, which retains them in position desired (Fig. 3). The casting-ring, inverted, is placed on the positioning-ring, over the crucible (Fig. 4), and the investment poured. When set, positioning-ring is removed, sprue wires are pulled out, the crucible remaining in place (Fig. 5). The case is then heated up and cast as usual. When cold the crucible is removed with the investment and may be used repeatedly. The cost is a trifle. Results Accurate and Dependable.

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a case of pyorrhea, he says it leaves the gums sensitive for a few days, and the diet must be of soft food. "Naturally," he adds, "the toothbrush is looked upon with dread, therefore a substitute is suggested. A piece of cheesecloth or cotton rolled on the finger may be used, or the skin of an orange or lemon. A strip of skin of the grape-fruit is an excellent abrasive used as one would a stick of sugarcane or an orange stick."

As a mouth wash, Dr. Westlake highly praises lemon, orange or grapefruit juice, followed by a glass of clear water. "Citric fruit juices," he says, "are especially effective if the skin and pulp are crushed together in a porcelain bowl, as in that way the vitamine, antiscorbutic and antineuritic elements are retained. The usual preparation for a wash is about five parts of water to two of fruit juice. The reason why lemon juice 'sets the teeth on edge' is because its action clears the mucin plaques from the teeth. The alkaline saliva is automatically stimulated by fruit acids.

"The dentist can restrain the decay of teeth, diseases of the gums and the infected areas of some roots but these inhibitory treatments do not insure immunity from recurrence if dental and body hygiene are neglected.

"While the physician is studying the medical pathology of the patient, the use of a fruit laxative is suggested as an emergency correctant which not only acts as mildly operative but has a favorable action in severe pyorrhea cases.

"One-half pound of prunes, pitted, chopped fine and soaked; one-half pound of figs, chopped fine; five teaspoonfuls powdered senna, one cup New Orleans molasses.

"Simmer for five minutes, pour into a Mason jar and keep in a cool place.

"Dose: One to three teaspoonfuls at night, as required.

"After the morning and evening meal the patient drinks the juice of two or three oranges and one lemon. Part, at least, of the skin should be crushed with the pulp, because it is accepted as carrying the vitamine content. This drink, after eating, appears to have direct action on the endocrine secretions as indicated by their stimulation, due doubtless to the rapid distribution of the natural organic salts of the fruit. In some cases the physician has recommended yeast treatments, which appear to have beneficial results.

"Every dentist who has been in active practice for twenty years or more knows from observation that decay of teeth and diseases of the gums are constitutionally associated with destructive metabolism. Decay of the teeth and pyorrhea alveolaris are primarily due to either a congenial or an acquired defect in the glandular co-operation of the individual. It is true that 'a clean tooth never decays.' Many an individual who has never used a toothbrush will show a perfect set of teeth.

"We are not required to go back to the aborigines to prove that statement. This statement may hurt the feelings of some masters of the unclean toothbrush drills. It may awaken them, however, to be diligent in the crusade to correct the 'wholesale' method of cleaning teeth and enroll them as teachers of the truth that each tooth and gum must be cleaned with the same care as is bestowed upon the individual nail of the fingers, once daily—at least until the evolution of an improved race, who will use clean cotton or a similar product rolled on the individual finger to massage each tooth."

Dental Society Meetings—1920

STATE SOCIETIES

November—18, District of Columbia, George Washington University, Washington, D. C.; Arizona, Phoenix.

December—2-3-4, Ohio, Columbus; 10, Delaware, Wilmington.

Dates to be announced — Arkansas, Little Rock; California State; Louisiana, New Orleans; Montana, Great Falls; Oregon, Portland; Washington, Tacoma.

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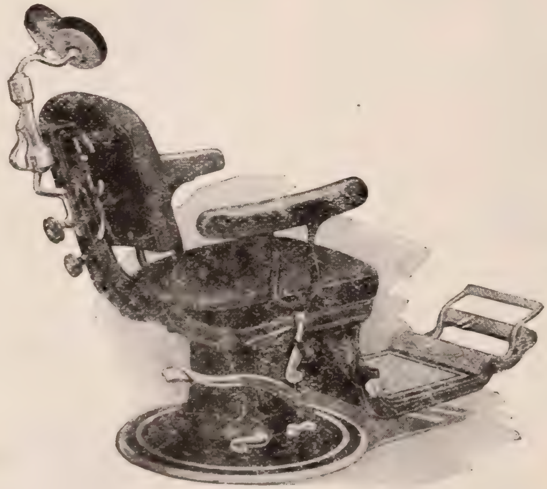

REGULAR CONTRIBUTIONS

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL October 1920 No. 10

PSYCHOLOGICAL FACTORS IN THE RETENTION OF ARTIFICIAL DENTURES*

BY DAYTON DUNBAR CAMPBELL, D.D.S., KANSAS CITY, MO.

SPECIAL LECTURER DENTAL PROSTHESIS, KANSAS CITY WESTERN DENTAL COLLEGE;
FOUNDER AND PRESIDENT OF CAMPBELL SCHOOL OF PROSTHETIC TECHNIC

"I WANT YOU to make me a plate like the one you made for Mrs. B." said a patient recently to the writer. His reply was, "Mrs. B. certainly was a remarkable patient. From the beginning of her case she seemed to have the most implicit confidence in my ability to provide her with perfectly satisfactory dentures. Then, too, there was nothing difficult about her case. I recall it very distinctly, because she waited two or three weeks before returning to have some minor adjustment made thinking that it would be all right after she had become accustomed to wearing them." With this reply, the writer succeeded at the outset in impressing this patient with the idea that she, herself, would be an important factor in securing dentures which she could wear with satisfaction similar to that enjoyed by her friend, Mrs. B. The writer knew that this confidence of the patient in his ability would contribute largely to his success with the case, but he knew also that too much confidence and too great enthusiasm with respect to this ability, or reputation for such ability, usually is harmful. He has seen this enthusiasm lead the patient to rely wholly upon the prosthetist, and accordingly he knows that the patient must be made to realize that successful dentures usually result from a partnership. In this partnership the operator's share of responsibility is largely that associated with the construction of the dentures, the patient's share is that of adaptation. How to secure proper co-operation from the patient so that the prosthetist's skill may yield maximum results is a problem of psychology. The beginning paragraph of this article suggests in dealing with a patient full of confidence, a method that experience has proved to be based on good psychology. It is also good psychology to begin this article with a concrete instance instead of general statements and definitions of the subject. The attention of some readers will thus be attracted who would otherwise regard an article with such a heading as holding nothing of interest for them, and such readers possibly may be interested to read the whole article.

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*This is the ninth of a series of twelve articles being written by Dr. Campbell, for the 1920 volume The Dental Summary.

Editor's Note: Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

The problem of articulation is mental rather than instrumental; the problem of denture construction is mechanical rather than anatomical; the problem of retention is fundamentally a problem of physics—but the success that may be achieved by the prosthetist who has mastered these problems, will be greatly increased if he is also a prosthetic psychologist. He may solve the problem of articulation to a nicety, problems of denture construction may be mastered with ease, while the answer of the laws of physics to retention may leave not the slightest doubt; yet the occluded dentures never may be used to masticate, mechanical correctness of the dentures never may be demonstrated, and instead of being retained the dentures may be returned to the prosthetist.

In the construction of artificial dentures the prosthetist will be concerned with mechanics and the laws of physics, in securing adaptation his problem is also, and largely too, a problem of mental processes. Psychology is the science of the mental processes; prosthetic psychology is the science of the mental processes as these are concerned with artificial dentures; prosthetic psychology applied is the art of employing one's knowledge of individuals in supplying them with satisfactory artificial dentures.

The prosthetist has an initial advantage over the dentist who is engaged in general practice, because the patient goes to the specialist with the confident expectation of securing superior results. Of course, to secure the continuance of this confidence the specialist must be equipped to render superior service. However, the maintenance of this confidence must not be encouraged in a way that will tend to relieve the patient of a feeling of responsibility for the success of the case. In the early days of his practice the writer encouraged confidence in his ability through the use of a fee bill printed upon the reverse side of his appointment card. Just below the space reserved for estimate appeared the following: "It is distinctly understood and agreed that should the dentures prove unsatisfactory sixty days after their completion, four-fifths of all money paid shall be returned upon receipt of the dentures." This encouraged the patient to expect satisfactory dentures *or* the return of his money, but at the time the writer discontinued this plan he believed that the patient was too often led to think about the date when he might get his money back rather than to center his attention upon wearing the dentures. The writer no longer says anything about returning any fee; he rather insists that the dentures will be all right, and that until they are all right his services are not completed and that he will welcome opportunity at any time to assure satisfaction in the wearing of any dentures that he ever has made. When the patient has tried sufficiently and the dentist finds, after ample opportunity has been given him, that he is unable to make the dentures satisfactory, the full amount of the fee should be returned. The return of the fee will no doubt come as a surprise to the patient and the chances are that he may prefer the dentures to the refund. The refund is made cheerfully and charged to general expense. The effect of this is to retain the patient's confidence and good will to such an extent that when friends raise the question of a dentist who may be recommended, a cordial reference will be given, together with a testimony that courteous treatment and satisfactory results may be expected.

The writer does not wish to raise here the question of justice involved in retaining or returning the fee, he is merely emphasizing the fact that the practice suggested above gets splendid results in an endeavor to increase a desirable clientele.

As a rule the patient comes to the dentist expecting the best service that he can render. Why it is that the dentist almost invariably assumes that his patient wants vulcanite dentures, is difficult to appreciate. If he is capable of constructing metal-base dentures and knows these to be superior to vulcanite he is morally obligated to supply his patient with the best. The writer can see no valid objection to discussing with every patient who comes to the office the superior qualities of a continuous-gum denture. Besides educating the patient, and friends or relatives who have accompanied, with reference to continuous gum dentures, the prosthetist gathers from the patient's comments, data which afford a truer rating than Dun or Bradstreet possibly could furnish. If the patient, when smiling or laughing, does not show a large portion of the gum, the esthetic features of the case may be provided for in gold or aluminum base dentures. When the problem of the esthetic requirements of the individual may be solved without continuous-gum dentures, the sense of well-being, which accompanies the wearing of this highest product of the artist's skill, may not be sufficiently impelling to prompt the patient's insistence upon being provided with these.

In the present day, it is rare to find an individual in moderate circumstances who fails to appreciate the fact, when properly brought to his attention, that he can well afford gold or aluminum dentures and even continuous gum when the esthetic requirements demand. If there is a victrola in the home the patient is in position to have aluminum dentures, if there is player-piano there can be no question about gold bases, and if he drives a pleasure-vehicle of any description he may fully justify his insistence upon continuous gum. Patients do not come to the office wearing jeans or calico; but many a dentist continues to dress then up with "jeans" or "calico" dentures. The range in possible expenditure for dentures compares with the range between a poor grade of burlap and the finest broadcloth. Perhaps the most lamentable phase of the whole situation is, that the dentist is not sufficiently acquainted with the surpassing merits of the highest-class dentures to believe in them, and to experience a sincere regret when he is compelled for any reason to supply anything else.

No doubt some readers of this article will be unable to dissociate an effort to render the highest possible service from a primary effort to obtain the highest pecuniary reward. If you are of this type, then argument is futile—you laugh at grand opera, you shun art galleries, you see nothing of charm in a Venus de Milo; for you, dentistry is largely drudgery, its ideals are vagaries and, besides bread and butter, there are no perquisites in life. To the artist prosthetist who rises to the level where he may live in the same realm with those whom he serves, Ruskin's sentiment makes a strong appeal:

> "All works of quality must bear a price in proportion to the skill, time, expense and risk attending their invention and manufacture.
>
> "Those things called dear are, when justly estimated, the cheapest. They are attended with much less profit to the artist than those things which everybody calls cheap. Beautiful forms and compositions are not made by chance, nor can they ever, in any material, be made at small expense."

All individuals possess a sense of well-being, and in order to gratify it surround themselves with something more than the bare necessities of life; some avail themselves of a broad culture, without expecting it to contribute aught else but a deeper enjoyment of life, and we Americans take pride in the fact that our standard of living and our sense of well-being is higher than that of the Orient. It was demonstrated in clinics of the National Dental Association both in Chicago and in New Orleans, as well as in the clinics at Boston this year, that dentures may be constructed which will absolutely defy detection as artificial, even within the closest conversational range. Who will dare to say that the restoration of facial beauty, together with almost normal masticatory power, relieving embarrassment, increasing self-confidence and filling the whole prospect of life with delight, is not deserving of even greater regard than the artist's achievement of a portrait whose charm lacks nothing but the breath of life itself?

The writer frankly tells the patient that the materials for dentures cost no more than the portrait painter pays for a few square feet of canvas, together with some brushes and some tubes of paint. It is hardly necessary to suggest that the media employed by the artist in mixing his paints and by the prosthetist in preparing the porcelain, and for which patron and patient are willing to pay, is never materials but always brains.

Metal bases, besides contributing to a sense of well-being, are superior to vulcanite in cleanliness, and in freedom from injurious effects upon the tissues, but they commend themselves most strongly to the patient perhaps because they are conductors of heat and cold. Patients wearing these are able more thoroughly to enjoy those viands such as tea, coffee, ice cream, etc., whose palatability depends largely upon the temperature at which they are served.

The writer employs a very simple device for the purpose of impressing upon the patient the relative merits of metal and vulcanite with respect to conductivity. It is a receptacle shaped to fit the wrist of the patient; the bottom is made of a strip of vulcanite and a piece of aluminum, or gold, placed side by side, with a ridge between forming two shallow compartments. Water is heated and poured into the compartment having the vulcanite base but the patient detects no change in temperature; when his hand is lowered the water flows upon the metal base and immediately the patient notes the warmth.

The patient's confidence in the prosthetist's ability to give satisfaction in the wearing of dentures is increased when he realizes the confidence that the prosthetist has in his own ability to give satisfaction in the case of metal bases, especially when he or she is assured that this is the last fee that ever will have to be paid for dentures, the prosthetist thereby agreeing to make any necessary corrections that may be required—apart from repairs necessary on account of accident or carelessness. When the esthetics of a case are not advanced through wearing a continuous-gum lower, this may be constructed of gold, the corresponding reduction in fee bringing the total fee to a point within the patient's willingness to pay.

If the patient does not refer to the fee, the prosthetist should very frankly mention it, saying perhaps: "Now, wouldn't you like to know something about what these restorations are to cost, and the terms on which they are supplied?" The answer is always in the affirmative, and the explanation is given, with emphasis upon the fact that half of the fee is to be paid when the impressions are taken and the balance when the dentures are inserted. The reader's attention is called to the fact that "inserted" does not mean "completed," for the dentures may not be completed (so far as minor adjustments are concerned) for six weeks or in some instances three months. The psychological value of this method of payment is so great, that the writer refuses to deviate from it regardless of the financial rating of his patients, and regardless of the fact that customarily in dealing with all other individuals they send a check the first of the month. When the writer has reason to believe that the patient may resent this as raising the question of integrity, it may be approached firmly by following up this statement of the terms with: "It is a rule that I always have followed and I am sure that you would not wish me to make an exception in your case." And then, without awaiting a reply, the operator may turn to another phase of the case with some casual remark, such as, "Did any of your natural teeth overlap?" If the patient has not been expecting such a plan and it is desired to take the impression at this first sitting, then, of course, the suggestion may be complied with at the next appointment. It is really an unimportant detail as to whether the fee is paid in two installments or whether the whole fee is paid when the dentures are inserted, but it is vital that there be a rule so as to strengthen the dentist's ability to insist that dentures must be paid for before they are worn out of the office, and a rule requiring two payments does not appear so exacting as a rule which insists upon the entire fee in one lump sum. The reason why this is so important that it permits no deviation, is because of the fact that it is the best possible method of encouraging the patient to lend the necessary co-operation to make the dentures satisfactory. Patients will wear their own dentures and will strive more earnestly and more patiently to grow accustomed to their strangeness, than they will when they are wearing dentures which still, in fact, belong to the dentist. This is unconsciously the case.

The patient's co-operation in making the dentures satisfactory may be encouraged also, if the dentist retains the old dentures; then the new dentures must, perforce, be worn and the more quickly will the tissues become adapted to them. The prosthetist may suggest: "I usually like to keep the old dentures and I shall take it as a favor if you will allow me to retain yours." If this is not successful, the dentist may possibly secure permission to retain them for a week or ten days. When the reluctance is insuperable, the writer requests finally that the patient promise not to wear the old dentures without previously securing consent, assuring the patient that consent will be given, if asked. Thus far in his experience consent never has been requested, and he never has learned of an instance in which the promise was not kept.

Retention may be promoted through avoiding some practices which encourage a patient to endeavor to dislodge the dentures instead of making every effort to retain them. This relates especially to impression taking. As a preface to our observations at this stage, the writer wishes to emphasize the fact that he believes that one skilled in the use of compound may achieve final results equal to those obtained with plaster. While he firmly believes this, he always has been impressed with the idea that operators who follow the modeling compound technic are severely handicapped through the fact that the contortions and grimaces taught the patient are decidedly deterimental, in a psychological way, to ultimate success in retaining the denture. In teaching the patient to endeavor by seven different muscular displacing activities, namely, by whistling, sneezing, coughing, hacking, yawning, spitting, grinning, to displace the impression, the patient is taught, whether the operator so intends it or not, that the finished denture will withstand similar efforts and be retained in spite of them. In the first place, the patient is misled into believing that the impression is an unusually good one, when the fact is, that any impression, if it produces a vacuum chamber, will be retained just as effectively. When the compound is pressed to position it is possible that an abnormally large vacuum chamber may be produced, and this may occur in very poor impressions. But granting that, except for this temporary vacuum, which is the primary factor in causing it to cling so tenaciously, the impression is perfectly reproduced in the finished denture, the tissues will change under the pulling effect of the vacuum, and the denture may then be displaced easily without any review of the lessons in displacement taught by the dentist when the impressions were being taken.

Often with pride and enthusiasm, greatly augmented by the patient's smile of satisfaction, the dentist unwittingly enters into a spirited contest, bantering the patient to dislodge the impression. The patient continues the contest with the denture and at the end of a few days emerges victorious, and returns to the office with an "I-told-you-so" expression on his face.

The writer in dealing with patients who previously have worn dentures without satisfaction, has found it wise, when the impressions tend to be displaced with difficulty, to remark: "Wouldn't it be gratifying if I could assure you that your denture would always 'stick' like that? It won't, because it will be made of different material and the abnormal condition which now prevails will not always exist." If the patient is conversant with chemical action or acquainted with the laws of physics, or is perhaps a structural engineer, it is time well employed when the operator proceeds to explain more in detail.

In the July issue of THE DENTAL SUMMARY the writer has indicated some phases in the progress of "Taking the Correct Bite," which he believes clearly show that the psychological factor is of equal importance with either mechanical or anatomical factors.

An incident of earlier practice is recalled of a patient for whom dentures were constructed. These were perfectly satisfactory except during working hours when he was employed at his cabinet work and operated a very fine-toothed scroll saw; the upper denture dropped whenever he attempted to blow away the sawdust that obscured the outlines of his pattern. The writer taught this patient how to blow when wearing artificial dentures, and the difficulty was overcome. He learned that he might blow as the flutist blows— with lips drawn to cover the embouchure—but never as the bugler, who tends to blow with cheeks and lips distended.

Occasionally a case is met with in which the patient is wearing dentures in which the bite is too close, and, accordingly, when the new teeth are set up to a wide open bite in order to conform to the esthetic requirements, the patient in masticating may bring them together with a click.

The prosthetist may boldly and properly shift the responsibility by calling the patient's attention to this, and by suggesting that it is unnecessary and should be avoided. Proper attention will enable the patient to overcome this objectionable feature.

A friend tells me that just as soon as he buys his steamship ticket he begins to feel seasick. And while the problem of seasickness has not been fully solved, my friend knows that it is influenced by mental conditions as well as by semi-circular canals. Patients subject to nausea often attribute it to the length of the denture. Since nausea, associated with the wearing of dentures, is produced in the vast majority of instances by a denture that very lightly touches the posterior portion of the palate, the writer is accustomed to deal with these cases by inserting the finger and quickly and firmly rubbing this portion, saying, "You don't suffer from anything of that sort. The trouble is that your denture isn't long enough." This is the fact: the base is not long enough, neither does it sufficiently compress the tissues in this region. When a fellow-bather playfully tickles the sole of your feet, as you recline upon the beach, the sensation is unendurable, but if he should boisterously apply a bastinado in Caliph of Bagdad fashion, the nerves of your feet would not resent the stimulus nearly so much. If a patient returns to insist that the denture is too long, the writer always and very willingly consents to trim away a portion, and, if in his judgment it is required, a liberal amount is cut off. On the other hand, if he knows that the removal of any appreciable amount will be detrimental to the retention, he makes good his willingness by using a cuttle-fish disc in his fingers, while with vigorous motions he "cuts back" the base to a supposedly very marked degree.

Two classes of patients, psychologically considered, give the prosthetist much concern. One of these is composed of stoics, the other suggests pampered children. Those in the first class wear away the dentures, and do not return for adjustment even though they suffer severely and may be tortured by some ill-adapted portion of the base. The writer personally calls this one over the 'phone and insists that the patient is not treating the prosthetist fairly in refusing to give opportunity for him to see the case. The other one returns with scarcely a pretext—and often. This patient should be given an appointment hour that will spoil a beauty sleep or make it impossible to attend the matinee.

Finally, psychology as a study of the mental processes will acquaint the dentist with the fact that while human beings have many traits in common, some of these traits are sufficiently pronounced to distinguish individuals as belonging to certain classes. Certain types or classes may be approached in certain rather definite ways, but since no individual belongs exclusively to any one of these classes, the application of one's knowledge of psychology to a particular problem of an individual case, is a question of skill, and its application may properly be termed an art. This can not be learned through a study of books but will be perfected in the course of experience. The fundamental prerequisite is a sincere effort upon the part of the prosthetist to fulfill his obligation as a vital member of society, through continually rendering the best service of which he is capable, welcoming every patient as an opportunity to do unto others as he would that they should do unto him.

729 Shukert Bldg.

A FEW PRACTICAL BUSINESS IDEAS

BY BERNARD FELDMAN, D.D.S., PATERSON, NEW JERSEY

(Written for THE DENTAL SUMMARY)

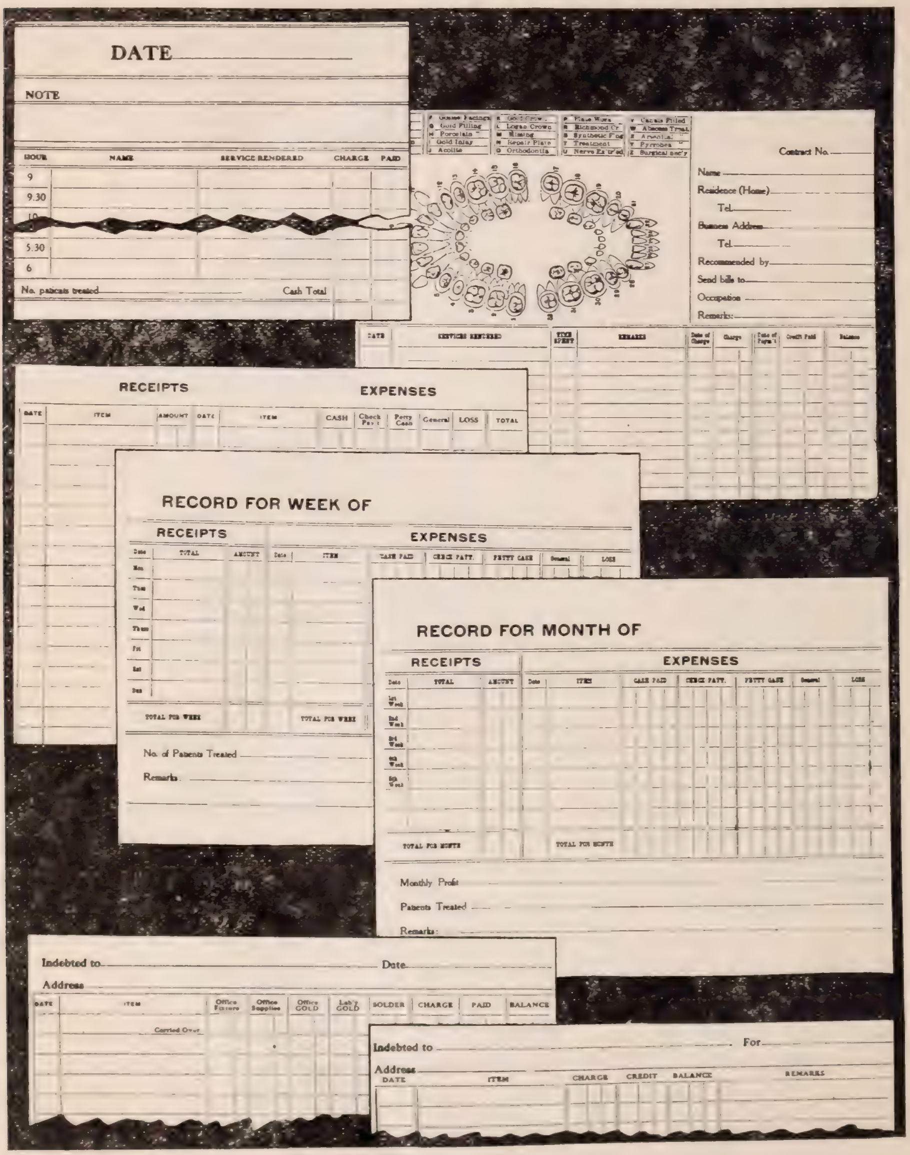
DENTISTRY HAS WON for itself a respected place amongst the professions. It has done so on meritorious service to suffering humanity, due to the many improvements which have taken place within the past decade, and which have added greatly to the comfort and health of the public.

While dentists have been improving their technic, which has enabled them to render this better service, the cost of living has been mounting higher and higher, until, today, the question of providing a good living for himself and his family has become a very important question requiring a very decisive affirmative answer.

This has forced the individual dentist to pay more attention to the financial side of his profession. I maintain that systematic business arrangements are a creditable asset to every dental office. The dentist who fails to keep good records is not conducting his practice in an orderly or creditable manner. On the other hand, a good system adds dignity and efficiency to a well regulated office. It harmonizes well with the spotlessly clean furnishings and appointments. It sets off the clean-looking doctor, who wears clean operating gowns while using the sterilized instruments handed to him by his lady assistant, who also is dressed in clean, white office gown, to look *her* part. Such an office assistant supervises and conducts the various details of the office much more efficiently than the doctor, whose time should be occupied solely at the chair. She renders such invaluable aid that she is becoming an absolute necessity in the modern office.

Among the many other things which she can do, is to keep accurate records of all financial transactions which take place in the office. To the average dentist, bookkeeping is a nuisance and a bugbear. Yet no one can deny that it is no less necessary for the dentist to be as thorough in this matter as in any other one thing which he is called upon to do daily.

The ideal system would be one that is simple, practical and thorough. To obtain such a system, I have devised a set of printed forms to take care of every contingency that might arise in dental practice. These forms were published in *The Dental Digest*, May, 1914, in my article, "Systematic Bookkeeping for Dentists." The entire set of forms



DATE ____________

NOTE

HOUR	NAME	SERVICE RENDERED	CHARGE	PAID
9				
9.30				
10				
5.30				
6				

No. patients treated ____________ Cash Total

Gum Facings	Gold Crown	Plate Worn	Canals Filled
Gold Filling	Logan Crown	Richmond Cr	Abscess Treat.
Porcelain "	Missing	Synthetic F'ng	Arsenical "
Gold Inlay	Repair Plate	Treatment	Pyrrhoea "
Acolite	Orthodontia	Nerve Ex'tr'ed	Surgical nec'y

Contract No. ____________

Name ____________

Residence (Home) ____________

Tel. ____________

Business Address ____________

Tel. ____________

Recommended by ____________

Send bills to ____________

Occupation ____________

Remarks: ____________

DATE	SERVICES RENDERED	TIME SPENT	REMARKS	Date of Charge	Charge	Date of Paym't	Credit Paid	Balance

RECEIPTS **EXPENSES**

DATE	ITEM	AMOUNT	DATE	ITEM	CASH	Check Pay't	Petty Cash	General	LOSS	TOTAL

RECORD FOR WEEK OF

RECEIPTS **EXPENSES**

Date	TOTAL	AMOUNT	Date	ITEM	CASH PAID	CHECK PAYT.	PETTY CASH	General	LOSS
Mon									
Tues									
Wed									
Thurs									
Fri									
Sat									
Sun									
TOTAL FOR WEEK				TOTAL FOR WEEK					

No. of Patients Treated ____________

Remarks ____________

RECORD FOR MONTH OF

RECEIPTS **EXPENSES**

Date	TOTAL	AMOUNT	Date	ITEM	CASH PAID	CHECK PAYT.	PETTY CASH	General	LOSS
1st Week									
2nd Week									
3rd Week									
4th Week									
5th Week									
TOTAL FOR MONTH				TOTAL FOR MONTH					

Monthly Profit ____________

Patients Treated ____________

Remarks: ____________

Indebted to ____________ Date ____________

Address ____________

DATE	ITEM	Office Fixtures	Office Supplies	Office GOLD	Lab'y GOLD	SOLDER	CHARGE	PAID	BALANCE
	Carried Over								

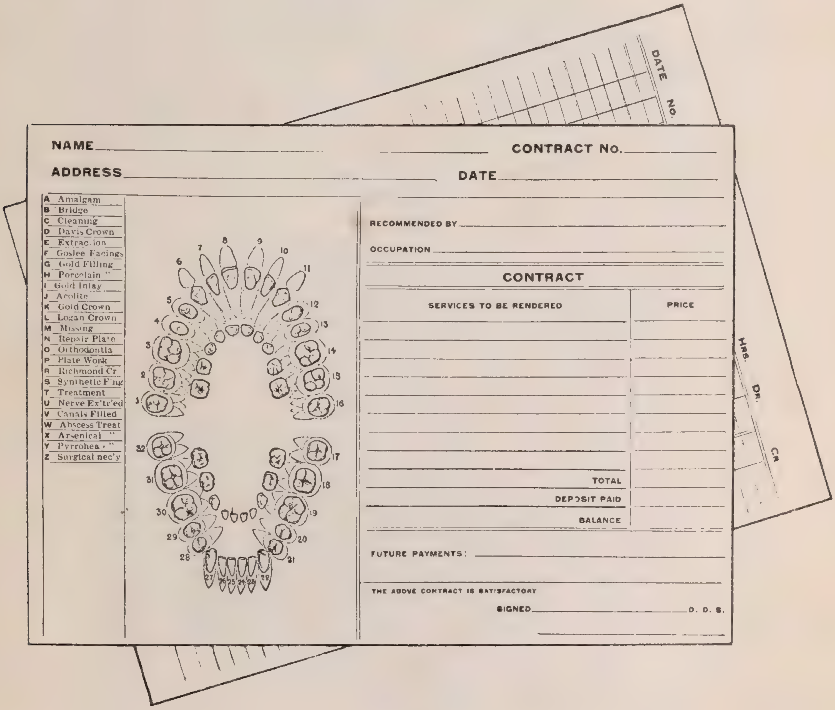
Indebted to ____________ For ____________

Address ____________

DATE	ITEM	CHARGE	CREDIT	BALANCE	REMARKS

Fig. 1

is illustrated in *Fig. 1.* It consists of: *First,* day book and appointments; *second,* patients' record sheet; *third,* daily cash record, (supplemented by special weekly and monthly total sheets) and *fourth,* the purchase ledger which is used to record all debts incurred by the dentist in his daily routine. These sheets are kept in four separate loose-leaf binders, and the combination makes a complete and thorough arrangement for the recording of all financial transactions. Dentists from all parts of the country wrote to me their approval of this system. It will prove worth while to the reader to study these printed forms carefully and to use some or all of them. Everything is so conveniently arranged for the office assistant, that it is a simple matter for her to fill in the various items as they come up during the day.


DATE
NO.
HRS.
DR.
CR.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32

NAME ______ ______ CONTRACT No. ______
ADDRESS ______ DATE ______

A Amalgam
B Bridge
C Cleaning
D Davis Crown
E Extraction
F Goslee Facings
G Gold Filling
H Porcelain "
I Gold Inlay
J Acolite
K Gold Crown
L Logan Crown
M Missing
N Repair Plate
O Orthodontia
P Plate Work
R Richmond Cr
S Synthetic F'ng
T Treatment
U Nerve Ex'tr'ed
V Canals Filled
W Abscess Treat
X Arsenical "
Y Pyrrohea "
Z Surgical nec'y

RECOMMENDED BY ______
OCCUPATION ______

CONTRACT

SERVICES TO BE RENDERED	PRICE
TOTAL	
DEPOSIT PAID	
BALANCE	

FUTURE PAYMENTS: ______

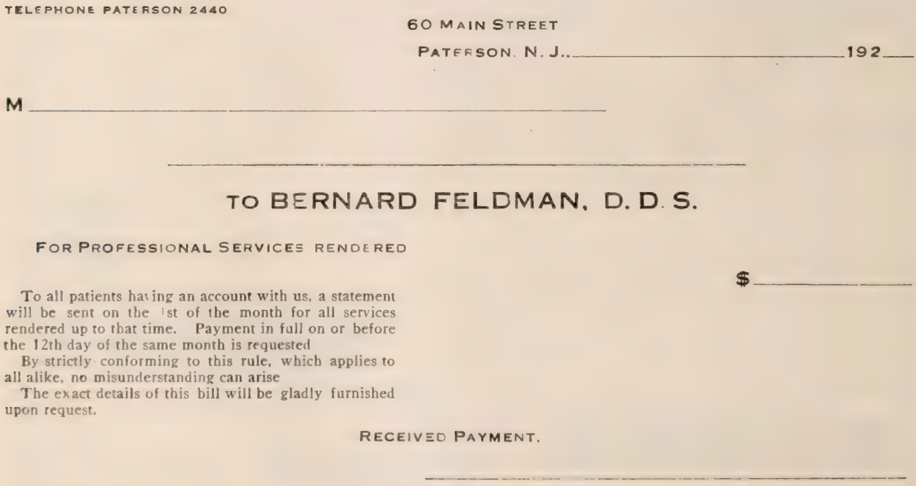
THE ABOVE CONTRACT IS SATISFACTORY
SIGNED ______ D. D. S.

Fig. 2

With the changes that have come with the times, I have been forced to supplement this bookkeeping system with two or three new stunts, and which furnish the excuse for my submitting this article. Perhaps these "stunts" contain some good pointers which will appeal to someone somewhere. Here's hoping that they will do some good for my confreres.

Fig. 2 is an illustration of my first and most important stunt. I call it the "Patient's Time Chart" and I keep it like others do their card index system. It has saved me many a dollar since I have decided to charge *for time.* I now make my time worth at least four dollars an hour to me. When I know that my patient can afford to pay well, I charge more than four dollars per hour according to the skill necessary and the service to be rendered. I believe that, if every dentist throughout the country were to place a minimum charge of four dollars for his hour's time, that it would do more to elevate dentistry to its proper plane in the eyes of the public than any other one thing. This is enabling me to receive fees for several types of dental service for which many of us, myself included, have received little or no pay. The relieving of toothache, plate-repairing, cleaning of teeth, consultations, etc., are now paying, thanks to my following Mr. Bosworth's advice. Other men like Dr. Clapp, have figured out for me that unless we do get four dollars at least for an hour, that we're losing money. So I'm following *their* advice, and am not sorry because they are right in charging for *time.*

This "Time Chart" is printed on two sides (see illustration). When the patient presents for the first time, the general details of the contract are recorded on the one side. I allow myself enough leeway when I am undecided as to the final course of treatment. Although I do not bind myself definitely in such a case, I do make it understood that the time involved will govern the amount of the final bill. A charge for this consultation is made upon the reverse side of this sheet (see illustration) and the payment is asked for in the nature of a deposit. If the patient consents to carry out to completion the details of the contract, the "Time Chart" is placed in its alphabetically-arranged place in a card index cabinet. Upon the completion of each session with each patient, my assistant removes this patient's "Time Chart" from the files, records the exact details of the treatment just rendered, and makes the charge



TELEPHONE PATERSON 2440

60 MAIN STREET

PATERSON, N. J., ________________ 192__

M ______________________________

TO BERNARD FELDMAN, D. D. S.

FOR PROFESSIONAL SERVICES RENDERED

$ ____________

To all patients having an account with us, a statement will be sent on the 1st of the month for all services rendered up to that time. Payment in full on or before the 12th day of the same month is requested

By strictly conforming to this rule, which applies to all alike, no misunderstanding can arise

The exact details of this bill will be gladly furnished upon request.

RECEIVED PAYMENT.

____

Fig. 3

which I decide is commensurate with the skill, service and time involved. This prompt attention will eliminate any mistakes.

For those patients who have an account with me, (I know that their credit is good), these charges are totalled once a month and transferred to the patients' ledger in its loose-leaf binder. (*Fig. 1*). A statement is sent regularly on the first of the month for such services which I rendered during the month. A polite request for payment before the twelfth is part of this statement. (*Fig. 3*). This monthly statement is Dr. Kells' idea, I believe, and is in accordance with the best business principles. Is it fair to be forced to wait longer than necessary for the payment of services already rendered? When these accounts collectively total up into hundreds of dollars, it will pay the dentist to collect this money monthly and to use it as nicely as do his patients. If this bill is not paid in time, the patient's credit suffers in my estimation and I feel my way carefully and tactfully before rendering additional service. The thoroughness and systematic arrangement assists me greatly in smoothing over these difficulties, because the patient realizes it is part of

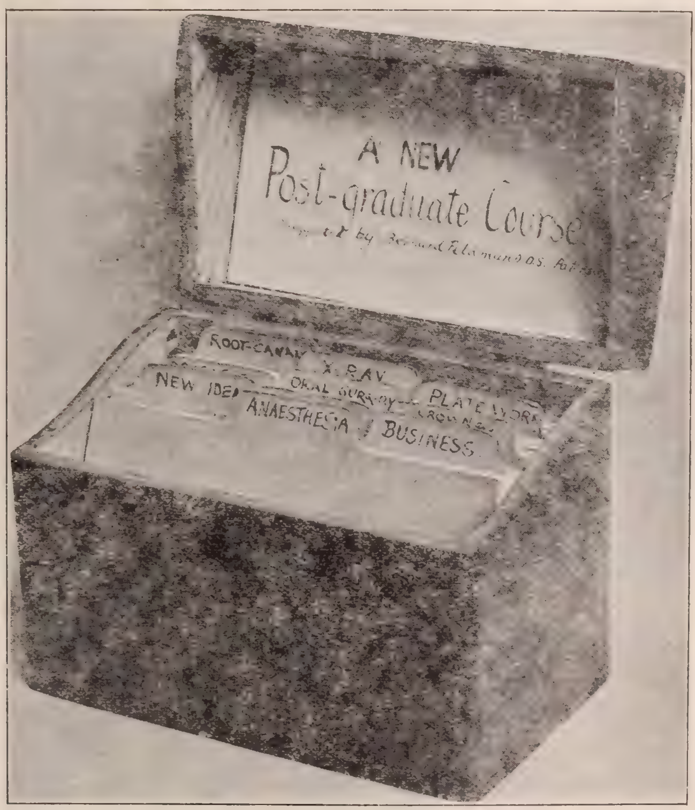
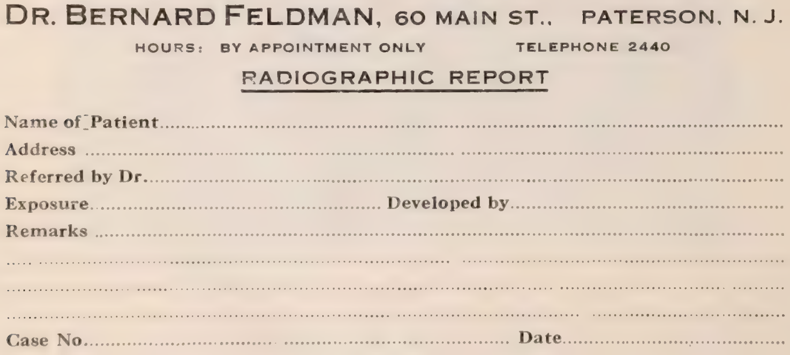


Fig. 4

the system to pay every month and does so willingly. It makes friends and adds to their respect for me. When the account is paid in full and the patient is dismissed, the "Time Chart" and the patient's record sheet are put away together amongst the closed accounts. As these sheets begin to pile up, it is most convenient to make place for them in one of the drawers of the desk.

My second stunt has been nicknamed by me, "A New Post-graduate Course", because it enables me to study up on any dental topic in my own office, in my own leisure time, at no expense to myself and with the greatest authorities as my teachers. (*Fig. 4*).

To keep in touch with the latest advances which have been revolutionizing modern dental practice, I took up, from time to time, several post-graduate courses in anesthesia, root-canal technic, the newest attachments in crown and bridge work, etc. This personal contact is the best means of getting the best results, but I feel that I have gotten a great deal of good out of reading the articles in dental magazines which were written by men who "know how." I sincerely believe that anyone can receive a fine theoretical post-graduate course if he will follow the teachings of the authors of these fine articles. Out of the great wealth of such literature I have selected the timeliest and best articles, arranged them into groups, indexed them on cards which recorded the author's name, the title of the article, and the name and date of the magazine in which each appeared. The list includes such names as Doctors Thoma, Blum, Riethmuller, Bosworth, Beach, Burgess, Tinker, Nesbett, Howe, Buckley, etc.



DR. BERNARD FELDMAN, 60 MAIN ST., PATERSON, N. J.
HOURS: BY APPOINTMENT ONLY TELEPHONE 2440

RADIOGRAPHIC REPORT

Name of Patient ....
Address ....
Referred by Dr. ....
Exposure .... Developed by ....
Remarks ....

Case No. .... Date ....

Fig. 5

Whenever I wish to read up, or to look up a certain article on a certain topic, I can immediately locate it. I have placed my dental magazines in regular order upon a shelf, and I keep them in regular order at all times. Many of these articles were published in THE DENTAL SUMMARY, proving to me that it is what it claims to be, "a journal of practical dentistry."

My third and last stunt is my envelope, (3½ x 6) for keeping accurate records of my X-ray films. The X-ray with all its limitations and with all the possibilities of misinterpretation, is here to stay. When used properly, it is a very valuable aid to good dental diagnosis and it is becoming a necessity in the modern dental office. A casual glance at the illustration (*Fig. 5*), will suggest the uses and advantages of such an envelope.

This entire arrangement may seem to the reader to be overdone. The writing and the reading of all these details may seem long and tedious, and may frighten the average practitioner from starting systematic bookkeeping. I wish to assure the *thorough*, practical man, however, that it simplifies matters greatly. The only way to be convinced is to try it out. It has been devised with the purpose of obtaining maximum efficiency with the minimum amount of effort on the part of the average dentist.

60 Main St.

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G. E. Harter, "Dental Operations, Material and Fees"—DENTAL SUMMARY, July, 1918.

The Portable Dentist

It wasn't a case so much of going to the dentist with the children near Toulis, France, as it was of the dentist coming to them. For the dentist's office was a camion clinic and the automobile made a tour of the ten villages in the Asine sector, visiting each of them once a week.

Nearly nine hundred boys and girls had their teeth filled, pulled and examined last summer. Tooth paste and tooth brushes were introduced for the first time since the invasion of 1914, and tooth brush drills were organized.

The Junior Red Cross, supplied the tooth brushes and tooth paste to their French brothers and sisters. Dr. Edna Ward, Cincinnati, Ohio, was the dentist who had charge of the clinic. Not only did she fill, pull and examine long neglected teeth, but in every village she gave toothbrush demonstrations, showing the boys and girls how to manipulate their brushes and lecturing on the care and cleaning of the teeth.

The Fourth Annual Roll Call of the Red Cross will be held from November 11 to 25, (from Armistice Day to Thanksgiving Day.)

TRAUMATIC OCCLUSION*

BY PAUL R. STILLMAN, D.D.S., NEW YORK CITY, N. Y.

THE TERM occlusion as used in dentistry defines the mutual mechanical relations of the opposing teeth. The word trauma means an injury caused by force. Thus the combination of these two words describes an injury by force which is caused by improper mechanical relations of the teeth during function.

The accepted definition of Traumatic Occlusion is as follows: "A perversion of the occlusal relations of the teeth when in use, whereby an excessive stress is brought upon one or more antagonizing teeth."

When Angle defined the term malocclusion reference was only to the passive arrangement of the teeth as they would appear from an examination of casts. The definition of Angle reads: "A perversion of the normal relations of the teeth when the jaws are closed." If these relations are perfectly normal in every way when the jaws are closed, they will also be normal when the jaws are used in mastication. Therefore in order to be completely satisfactory, this definition must be understood to imply that the relations of the teeth shall be so perfect as to be normal also in the functions of mastication as well as when occluding, a point which is very apt to be overlooked by the average observer in studying post mortem osteology or making orthodontic diagnosis from casts.

The Angle definition does not, on the face of it, take into consideration the axial measurements of the teeth as in supra-and infra-occlusion nor their relation in the condyle path to the plane of occlusion, nor does it include the relation of the associated structures or attempt to define that greatest of all the necessities in occlusion, viz; coordination in function. Neither will this paper attempt to solve this problem. All that this paper hopes to accomplish is to call attention to a fact which has probably been frequently observed by many others, that there is a malrelation of the teeth in function—a relation which satisfies the definition of normal occlusion as defined by Angle—yet, in which there exists incoordination of the occlusal inclined planes during the function of mastication. In other words Traumatic Occlusion may co-exist with apparent normal occlusion in both those cases in which the arches have developed in the natural way as well as those which have been treated according to the present-day standards of orthodontic practice. Several finished or completed cases in orthodontia have been observed in which the occlusal re-arrangement of the teeth presented to the not too critical observer a very satisfactory as well as a very esthetic appearance, where the departure from the ideal as established by the rule of the Angle classification would appear as insignificant. To the periodontist these cases have shown symptoms of incipient periodontal disease, gingivitis and the presence of detritus. Cases which persistently show these symptoms are suspected of having a traumatic occlusion and traumatic occlusion has, in fact, been found in all of these cases. When they were referred back to the orthodontists who had treated the malocclusion, appliances were replaced and treatment for coordination of the occlusion instituted.

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*Presented to the Ohio State Dental Society, Dec. 1919.

Normal occlusion is usually accompanied by co-existing normal coordination in function. This never has been denied. Normal occlusion in certain skull specimens, (such for instance as the well known Broomell specimen), shows an amazing absence of periodontoclasia when examined by a periodontist, while at the same time it excites the admiration of orthodontists for the perfection of its arch arrangement and its ideal plane of occlusion.

The American Academy of Periodontology, through its committee on scientific research and nomenclature, has adopted a statement of the following condition sessential to normality in the periodontal tissues and also in regard to the occlusal relations predisposing to traumatic occlusion, and I cannot do better than to interpolate two statements: *First*, conditions essential to normality in the periodontal tissues from the standpoint of occlusion.

(*A*) Normal mesiodistal and buccolingual relationship between the jaws and between the individual teeth.

(*B*) Normal distance or space between the jaws vertically and laterally or individual opposing teeth when the teeth are in occlusion.

(*C*) Normal occlusal surfaces (either natural or restored) with proper coordination of these with the opposing jaw.

(*D*) Normal contact points, natural or restored, between all teeth.

(*E*) Wear of the inclined planes of the cusps through use in mastication, thereby bringing about a dissipation of (occlusal) buccolingual stress, in the gliding motion of tooth against tooth. *Second*, occlusal relations perdisposing to traumatic occlusion.

(*A*) Normal occlusion (Angle classification) where opposing cusps and inclined planes interfere with freedom of motion petween the jaws and individual teeth; in other words, lack of coordination.

(*B*) Malocclusion (Angle) of every form.

(*C*) Shifting through lost approximal contact support due to extraction.

(*D*) Faulty restorations, including fillings, crowns, bridges, fixed or removable, where incoordination exists between them and the opposing teeth, insufficient number or strength of abutments, etc.

Traumatic occlusion may be acquired when any of the teeth are driven outside their normal limits of motion within their sockets through excessive occlusal pressure. These improper occlusal relations may be produced by shifting—as where a first or second molar has been lost: instance, a shifting forward of the second and third molars into the space recently occupied by a first molar. It may be produced by the erupting of second molars in torsion; orthodontists observe in this a potent force for maladjustment and it is likewise doubtless a potent factor in the etiology of traumatic occlusion. Faulty contact points: instance, in all approximal restorations by plastic materials where the contact point is lost by a lack of integrity of the material: instance, careless operations of ignorant operators. Occlusal operations: instance, when an occlusal surface of either a filling or a crown is built too high either on one or more cusps, or where the absence of cusp formation permits a shifting of the tooth thus distributing force even to the entire arch. Formation of abnormal habits in mastication: instance, when the habit is to use one side to the exclusion of the other, resulting in an absence of wear upon the side which is in disuse. Again the deformity caused by abrasion of the inclined planes may so interfere with function as to produce stress when the dentures are worn into each other. In such cases as this where the bite has been slightly closed through occlusal wear of the bicuspids and molars the cuspids and incisors also suffer through a lack of wear.

One may conclude that "health depends upon normal function;" deformity either of the teeth themselves or of the relation of the teeth in the arches interferes with function. Traumatic occlusion is the sequel of dental incoordination.

Nearly every writer upon the subject of periodontal disease has recognized malocclusion as an etiological factor in its development. Yet, strange to say, the particular form of malocclusion with which we are dealing has only been identified and recognized as a potent factor in the causation of periodontal disease in recent years.

The first principle of the treatment of any disease is an attempt to eliminate the contributory factors. This being the case, does it not appear to be more than an accident of fate which has brought the two specialties of periodontia and orthodontia together into one department of the National Dental Association? Was it not an act of Providence?

Analysis of cases indicates that occlusal trauma is manifested in three ways as regards the application of force to the tooth. *First,* through elongation, whereby the tooth extends out of its socket. *Second,* through tipping, whereby force is applied at an abnormal angle to the long axis of the tooth. *Third,* the wedging of one inclined plane in gliding past another, whereby the tooth is forced to one side of its socket.

Study of these cases reveals the fact that the injury is of a different character from that produced by any other etiological factor. The impact of a traumatic occlusion is transmitted through the tooth structure to the entire pericementum and associated structures instead of first attacking the tissues at the gingival border, as is the case with all other irritants. This accounts for the character of the lesions produced, most noticeable among which are excessive mobility of the tooth and pocket formation.

Traumatic occlusion unless compensated by abrasion through the aid of vigorous general and local health, invariably exhibits accompanying symptoms of periclasia. This stress when sufficiently pronounced may induce a lesion of the pericemental tissues, which in its early stages is physically manifested by an abnormal mobility of the teeth and radiographically by a thickened or hypertrophied pericementum and radiolucent areas in the osseous investment. The macroscopic incipient symptoms may be no more than capillary stasis of the gingival and organ circulation; while those in which the condition has been allowed to continue over a period of years may present the familiar atrophic symptoms of a chronic so-called pyorrhea.

The detection of the traumatic factor in advanced cases of dental periclasia is comparatively simple. Socket mobility and pocket formation point unerringly to traumatic occlusion. Before these lesions have been produced we must look for milder symptoms. Gingivitis and serumal calculus are early symptoms, especially when these are not readily explainable by the presence of other etiological factors. Peculiar elevations of tissue usually of the same color as the gingival tissue, a little above the margin and dark lines running from the gingival margin parallel to the tooth root are also some of the diagnostic signs.

The treatment of all of these cases may best be accomplished by orthodontic procedure and in the youthful it is easy to procure orthodontic treatment. But many of the cases of malocclusion, in fact the largest percentage of cases in the practice of a periodontist, are pathological, being complicated with periodontoclasia and are past the age of youth, most of them occurring in middle or in advanced middle life. Upon this type of case the average orthodontist proceeds to frown. There is a very general belief among these specialists that pathological cases which have passed the period of youth are not desirable cases. Doubtless they present problems and phases in treatment which are difficult and at the present time not widely understood. Yet here is a field in orthodontic practice which opens up an almost limitless supply of clinical material as well as a very interesting subject for study.

Every case of traumatic occlusion needs functional or physiological rest for the periodontal tissue cells before the benign processes of cell regeneration may be inaugurated. This rest may be obtained by coordinating the occlusal surfaces through modifying their shape. This is usually accomplished by grinding, a method of treatment which has already been described. It is a method which could not be considered other than pernicious by the average orthodontist of today. The very fundamentals of orthodontic teaching and practice are violated when teeth are mutilated, provided their form was previously normal. Yet it is necessary in surgery at times to deform and mutilate in order to save life. So it is in periodontia and even at times in orthodontia. Nature deforms by function. The orthodontist who is treating a case of adult malocclusion and who finds it difficult to secure an ideal cusp relationship either because of acquired deformity through occlusal abrasive wear or a missing tooth, must make up his mind that it is necessary to grind the cusps during treatment so that an arrangement may be secured which will give coordination in the functions of closing and mastication. This is only what nature herself does by abrasion if the supporting tissues are sufficiently vigorous. Lacking this, traumatic occlusion is instituted and disease will surely follow.

The periodontist's cases are always pathological while those of the orthodontist are usually physiological. Unless the orthodontist steps into the breach with the special knowledge he possesses upon the subject of occlusion, the mutilation of teeth by grinding must continue to be practiced for the reason that, through these admittedly inferior methods, even some of the most advanced cases of periclasia are restored to periodontal health.

52 Vanderbilt Ave.

ORAL SEPSIS IN ITS RELATIONSHIP TO SYSTEMIC DISEASES*

BY DR. ROBERT T. ALLEN, LUMBERTON, N. C.

THE RELATIONSHIP of oral sepsis to systemic diseases is one of the most important questions facing the dental profession. It is not a new question for sepsis is eternal, but it has only been during the last few years that widespread scientific investigation has been attempted in this field as related to dentistry.

A knowledge of this subject is important to a dentist because of the complex etiology existing between mouth infections and some systemic diseases such as carditis, endocarditis, neuritis, joint affections, headaches, eye troubles, and numerous other systemic conditions.

It is immediately apparent in studying this relationship that it is necessary to enter somewhat into the fields of bacteriology, immunology, hygiene and pathology because of the relationship which frequently exists between chronic diseases and certain inflammatory processes which cause systemic disturbances.

A small infection which creates no special local trouble may cause a serious disease of some of the organic structures of an individual, although there is no apparent connection between them. For instance, many scientific investigators say that a so-called blind abscess which is unnoticed by a patient, may be the foci of infection in which the streptococcus pyogenes germs are incubated, and that these germs find their way to the heart or other organs of the body and start up an active inflammation.

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*Read before the North Carolina State Dental Society, 1919.

A germ may be transmitted either through the lymph or the blood. It has the faculty of penetrating connective tissue and it is said to be harmless while in motion, but when it comes into contact with an organ whose resistance is lowered, it stops and an active infection is developed. This being true, it is evident that most serious conditions may result from an apparently insignificant focus of infection located in the mouth.

In these days the enlightened physician who is investigating and treating systemic diseases seeks the advice of an intelligent dentist about mouth conditions, realizing that no complete summing up of a diagnosis of a case of systemic disease can be made unless it includes a thorough inspection and study of the teeth and allied tissues by a professional man scientifically trained along these lines.

Some physicians advise the sacrifice of their patient's teeth without proper dental investigation, acting on the theory that the teeth might be the cause of disease, but other physicians insist that a tooth should not be sacrificed unless there is a good and sufficient reason why the teeth should be extracted. When, however, it is shown that a tooth harbors foci of infection, then it should be removed.

A scientific dentist is the best judge of diseased dental conditions, and in all cases relating to the teeth his advice should be sought. Dental diseases are outside of the field of a physician or surgeon, but there should be earnest cooperation between professional men in the diagnosing and curing of disease.

The relationship of diseases of the oral cavity and other ograns was recognized years ago, but it did not receive general attention. However, Dr. Benjamin Rush, one of the signers of the Declaration of Independence, and a physician of note, writes, as far back as 1801:

"In October I attended a Miss A. C. with rheumatism in her hip joint, which yielded for a while to the several remedies for that disease. In November it returned with great violence, accompanied with a severe toothache. Suspecting that the rheumatic affection was excited by the pain in her tooth, which was decayed, I directed it to be extracted. The rheumatism immediately left her hip and she recovered in a few days. She has continued ever since to be free from it."

Dr. Rush also described other cases of systemic disorder arising from bad dental conditions which came under his observation and were treated and cured. One case of dyspepsia, another of epilepsy, and he writes, "I have been made happy by discovering that I have only added to the observations of other physicians in pointing out a connection between the extraction of decayed and diseased teeth and the cure of general diseases."

A Dr. Darwin and a Dr. Petit stated at an early date that they had relieved headache and vertigo by extracting decayed teeth, and in another report, Dr. Rush mentions a case of a woman who suffered greatly during her menstrual period, the flow being deficient. Inflammation, pain, and ulcers occurred in the mouth monthly at the time of her menstrual period. Upon extracting several decayed teeth she was relieved from this disease and the menstrual flow became regular.

Dr. Rush further says, "A small tumor, concealed in the fleshy part of the leg, has been known to bring on epilepsy. A trifling wound made with a splinter or nail, even after it has been healed, has often produced a fatal tetanus. Worms in the bowels have produced internal dropsy of the brain, and a stone in the kidney has excited the most violent commotion in every part of the system. When we consider how often the teeth, when decayed, are exposed to irritation from hot and cold drinks and ailments from pressure of mastication, and from cold air, and how intimate is the connection of the mouth with the whole system, I am disposed to believe that they are the unsuspected causes of general and particularly of nervous diseases."

Coming down to observations of our own day, we find Eugene S. Talbot, M.D., D.D.S., of Chicago, stating in a recent address on "Bone Absorption Around the Roots of Teeth," that "absorption of bone, inflammation and abscesses occur without the knowledge of the patient. The patient is not aware that pathologic changes are taking place about the root of the tooth. There is no tenderness, pain, heat, or swelling or other clinical manifestations by which root sepsis can be determined. It is only in the case of the alveolar abscess when the peridental membrane becomes involved and pus is burrowing its way through the dense outer plate of bone, that heat, pain, and swelling are produced." Again he says, "From a medical viewpoint, I have laid down the following axiom in my practice, *A patient's health is worth more than all the teeth.* If patients with one or more pulpless teeth are complaining of bad health, I do not hesitate to remove the pulpless teeth when all other sources of infection have been excluded. I have arrested arthritis deformans, cured headaches, indigestion, boils, skin eruptions, large glands in the neck, supposed to be due to tuberculosis, and other diseases, by removing pulpless teeth that did not show defects in the X-ray."

Oral sepsis is a question that has been important to humanity ever since the advent of Adam upon this earth, and as the population increases and living conditions become more intense, the subject continues to grow in importance; and this is not to be wondered at when it is considered that many deleterious matters gain entrance to the organic tissues of man through the different orifices of the body, or by contact with, or by, some direct injury to the body. For instance, food is taken into the mouth and particles of it may remain lodged in the teeth after mastication. These particles undergo a putrefaction and discharge poisonous matter into the mouth. Abscesses, either alveolar or pyorrheal, incubate disease germs which are capable of infecting organic tissues, under favorable conditions.

Very few individuals who have reached two score and ten years and who are troubled with oral sepsis are in good physical condition. On the contrary, it is usually found that a large number of such individuals are suffering from some chronic disease. People who have lived past middle age into old age with sound, healthy teeth are remarkably free from systemic diseases.

An individual who has lost his natural teeth and has had them replaced by a satisfactory denture of artificial teeth has better health as a general rule than the average man who has retained in his mouth natural but diseased teeth.

Poor mastication is a bad condition and is often brought about by carious teeth, which permit food to slip from beneath the teeth without being properly torn, crushed, and ground into pulp as it should be. The infection of food by debris from carious teeth, or by pus which may be present in the mouth either from pyorrhea or other diseases of the gums, or from alveolar abscesses, also is a grave matter, for these substances are masticated with the proteid products of the food and this infected mixture is carried into the stomach. While it is generally considered not probable that systemic diseases are caused by improperly-masticated and infected food being taken into the stomach, because the digestive system in its normal state is capable of converting many deleterious substances into neutral elements, yet the conditions referred to undoubtedly compel the stomach to perform unnecessary extra work and it frequently breaks down under this overstrain.

There can be no doubt, however, that foci of infection caused by abscessed teeth is a direct cause of systemic disease, and it is often of such a nature that its evil work is unsuspected and hard to detect. Many teeth have chronic abscesses at their apices that do not cause pain, nor do they discharge pus on the surface of the gum. The patient has no history of them, nor is he conscious of any abnormal conditions at these points. There is no apparent source of drainage from a so-called "blind" abscess, but knowing that pus burrows to the point of least resistance, we naturally suppose that these blind abscesses have an opening which has not been detected.

Pyorrhea is a dental disease that is receiving more attention than ever before from health specialists. Its importance as a disease factor has been so far recognized that a special branch of dentists who are known as periodontists, devote their efforts exclusively to this disease, and there is a well-grounded belief that the disease germs found in pyorrheal pockets are capable of and do cause serious systemic disease when brought into favorable relation with an organ whose resistance is weakened. However, there is a theory that the free drainage of pyorrheal pockets makes the disease a less important factor in the production of systemic disease than an alveolar abscess which is supposed to be "blind," that is, it has no visible surface drainage. A dental abscess is located within the osseus tissues; thus it is enclosed within bony walls and this makes it a more dangerous field for septic infection than an abscess located in the soft tissues.

An alveolar abscess is usually located at the apical portion of the root of a tooth and does not always give rise to any symptoms which may attract the attention of a patient. On the contrary, pyorrhea is full of disagreeable warnings to the patients, such as bad odor, pus, irritation, and inflammation. In many cases patients who have focal infection caused by abscessed teeth refuse to believe that their systemic illness is caused by the foci of infection in their oral cavity, even after the presence of such foci has been proven by radiographs, and other scientific diagnosis. These patients experience no pain or other symptoms in the mouth, and this, in their unscientific judgment, proves that their systemic ailment is not caused by diseased teeth.

Focal infection caused by diseased dental organs is progressive in its occurrence. It is not general in the teeth of the young, but as the individual matures, it is found more and more and there are few people of extreme age who escape it. Defective dental work is often the cause of focal infection. Some dental work is so faulty in its construction and placement that it actually creates a favorable condition for oral sepsis. However, it must be recognized that it is difficult to construct any dental appliance upon the natural teeth that will not cause oral sepsis to some extent.

It has been estimated by scientists who have made a study of oral sepsis and its causes that over one-half of pulpless teeth will show areas of infection at their apical ends, indicating a septic condition; and that a large percentage of dental work extending under the gum margin—by operators of all classes—coming under their observation, causes irritation of the tissues, resulting in oral sepsis, which in almost every case later results in pyorrhea.

Dentistry has struggled forward from a small beginning until now it is a recognized profession with a large and growing field. In the early stages, when it was a new science, its devotees only extracted diseased teeth for the relief of pain and later replaced the lost teeth with dentures. Then came goldfoil fillings, and the theory of filling the root canals of pulpless teeth. In those days it was taught that a "dead tooth," if its root canal were properly treated and filled, was better than a live one. Later came the crown and bridge to take the place of partial dentures; this was followed by the inlay. Now the great question is, "How can we avoid oral sepsis?" for it is the disturbing guest at the feast.

Only a comparatively small number of dentists have made a scientific investigation of oral sepsis. At least, they have not given it the thought that it should receive. Their dental work has not been done with the supreme motive of avoiding sepsis and they have left in the mouths of their patients septic teeth and septic appliances and thus, although these patients wore beautiful pieces of mechanical dentistry, their health suffered and even their lives were endangered.

Many of the best operators in the dental profession have in the past allowed patients to leave their offices with septic areas in the mouth and they are continuing to do so. They have this general view of the situation, that is, they are still looking placidly at focal infection caused by oral sepsis—a condition that may result not only in the loss of other teeth, but also in serious systemic diseases, leading to loss of life itself. This is not a criticism of dentists, for they have been actuated by high motives, but henceforth a dentist who wishes to be classed as a scientific man will be compelled to reason out what are the relations between the services he performs for a patient and the general systemic health of that patient. He will have to cease the indiscriminate destruction of tooth pulps and the making of restorations simply because of their mechanical perfection and beauty of appearance. He will have to recognize and remember that the principal object of his vocation is the prevention and cure of disease.

ORAL PLASTIC SURGERY*

BY BERTRAM S. ROTHWELL, D.D.S., CLEVELAND, OHIO
MAJOR A. E. F., U. S. ARMY.

THE PICTURES which I have to offer to you this morning are those taken while serving with the British and American Facial and Jaw Hospitals.

As these cases were admitted to the hospital, it was our aim to get the cases ready for early splinting and to work out a desired splint pertaining to the various fractures of either maxilla.

The cases were first thoroughly X-rayed, having a lateral and anterior posterior view taken so as to show the degree of fracture as well as the loss of structures and also locating the positions of foreign bodies.

Splints—The impressions were taken in plaster of Paris with parts well vaselined. The models were then broken according to the desired articulation. After the articulation of models was procured, a swaged splint of Victoria metal was made from dies of these models. These splints were made for simple fractures or for fractures taking in a number of teeth. These Victoria metal splints were then cemented into position by Ames copper cement, this cement being the most desirable, as it sets under moisture. These types of splints will be illustrated later in the pictures.

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*An illustrated talk at Ohio State Dental Society, Dec., 1919.

Aluminum Splints also were made and cast to fit the teeth in the area of fractures, always allowing the occusal surface to protrude, thereby allowing the mastication of soft foods.

These, also, will be shown in the pictures.

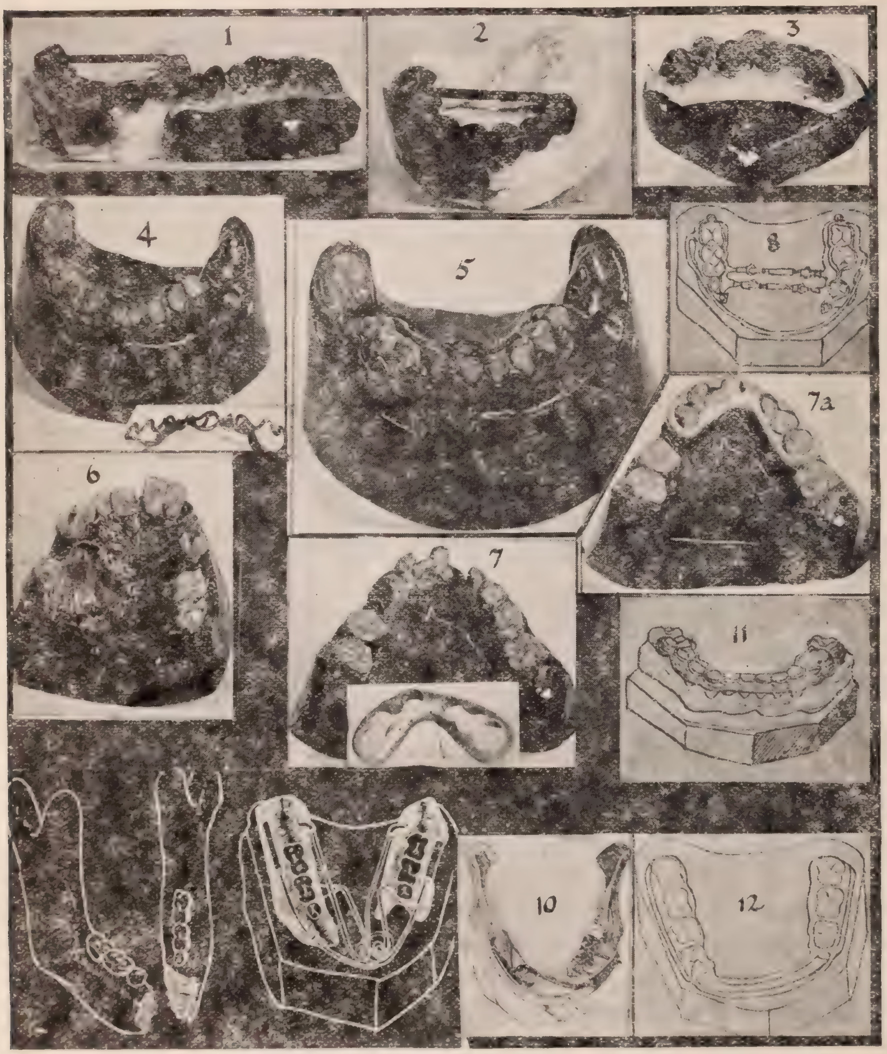


Fig. 1—This gives you an idea of a lower or upper swaged Victoria metal splint, as it would look cemented into position in the mouth with Ames copper cement.

Fig. 2—This shows the bar soldered from bicuspid to bicuspid across the mouth, strengthening fractured sections of the upper jaw.

Fig. 3—This is a lower Victoria metal splint in position.

Fig. 4—Another type of splint where just the teeth and process were held in position. Main body of the bone not being fractured.

Fig. 5—Shows the splint in position.

Fig. 6—Cast of an upper. An explosive bullet exploded in the face, fracturing the anterior portion of the jaw, throwing a central and lateral and portion of the process out of position.

Figs. 7a, 7b—Splint of aluminum, having the occusal surface of teeth protruding through, so that patient would be able to masitcate his food.

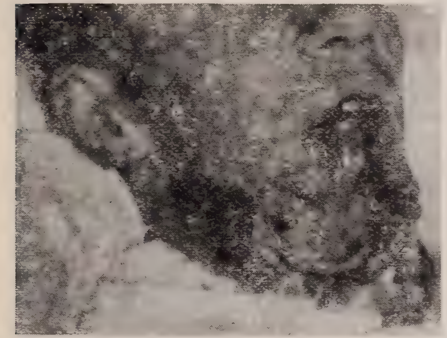


Fig. 13

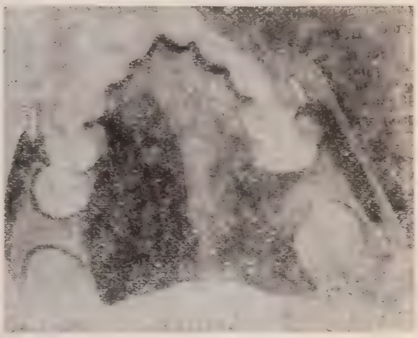


Fig. 14

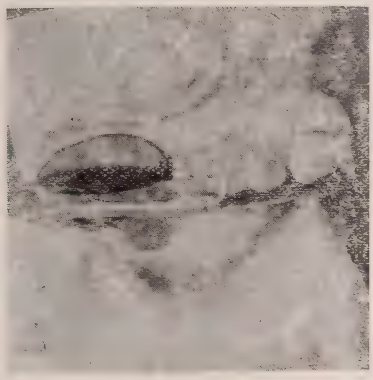


Fig. 14a

Fig. 8—A splint commonly used when the two sections had a tendency to go inward.

Fig. 9—High tension wire splint with vulcanized flange to the linguals.

Fig. 10—Another type of spreading splint by moving wires from posterior to anterior lugs.

Fig. 11—Cast aluminum splint.

Fig. 12—Splint after the two fractured portions had been well separated.

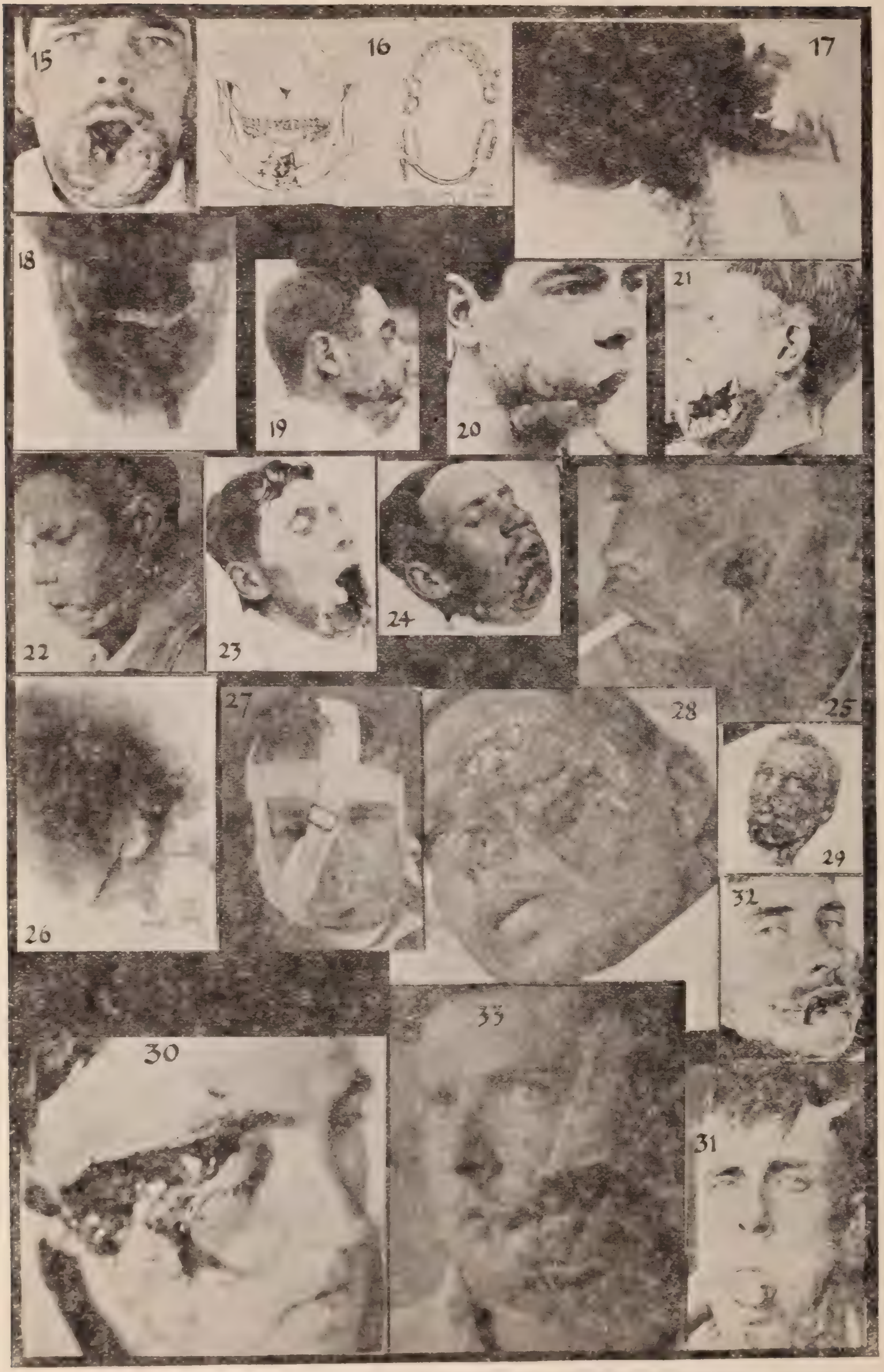


Fig. 13—A case that had the anterior portion of the jaw from the molar to the lateral of opposite sides blown out, as well as the tongue, and fractured at both angles.

Fig. 14, 14a—Shows the upper vulcanite in position. The lower section is cemented into position, holding the two fractured sections at rest. This is a splint with trombone slides to keep the sections from lateral movement. These cases were fed with feeding tubes. The man fed himself by slipping a rubber tube down his throat; this being attached to a feeding cup with glass intermittent tube, so he could watch the liquid pass through the tube.

Fig. 15—Shows the chin with anterior portion of jaw and teeth badly infected and swollen.

Fig. 16—The type of splint made for such a case.

Fig. 17—X-ray; machine gun bullet entered the man's mouth, lodged in his neck. This plate shows the anterior view.

Fig. 18—X-ray plate showing posterior view. By measuring these two views, the bullet was found to be lodged just below the mandible at the bicuspid region.

Fig. 19—Showing case of a man who had lost entire lower jaw from the angles to the symphysis.

Fig. 20—Same case being sent through for reconstruction.

Fig. 21—Eighteen-year old boy had both legs taken off with the same shrapnel that injured his face.

Fig. 22—Shows the jaws properly splinted, primary suturing of the wound as sent on for reconstruction.

Fig 23—Case of blown-off chin, still having the vermilion line of the lips.

Fig. 24—This is a picture after the chin had been sutured.

Fig. 25—An Australian; one of our worst hard tissue mutilations, who was struck with a high explosive bullet that spent itself in the mouth.

Fig. 26—This shows the X-ray of the case. Complete loss of the superior maxillary bones.

Fig. 27—A Yankee struck with butt end of a rifle, fracturing the superior maxillary and the anterior portion of the lower. Head splint made of strong tape, and buccals being constructed so that the face could be brought into shape by tension from the buccals.

Fig. 28—Hand grenade wound. Patient still had a good eye on the right side.

Fig. 29—Mustard gas burn. Lived eleven days.

Fig. 30—A Yankee with gutter wound with loss of eye.

Fig. 31—Shot through and through, severing the tongue at the base. Tongue later sloughed out.

Fig. 32—Mouth case after the primary sutures had been brought up.

Fig. 33—Hook and eye bandage. These were cemented to the face and the tissues brought together by silk thread.

Fig. 34—Case of an Australian. Struck through the nose, severing the upper lip, fracturing the superior maxillary and tearing downward through lower jaw.

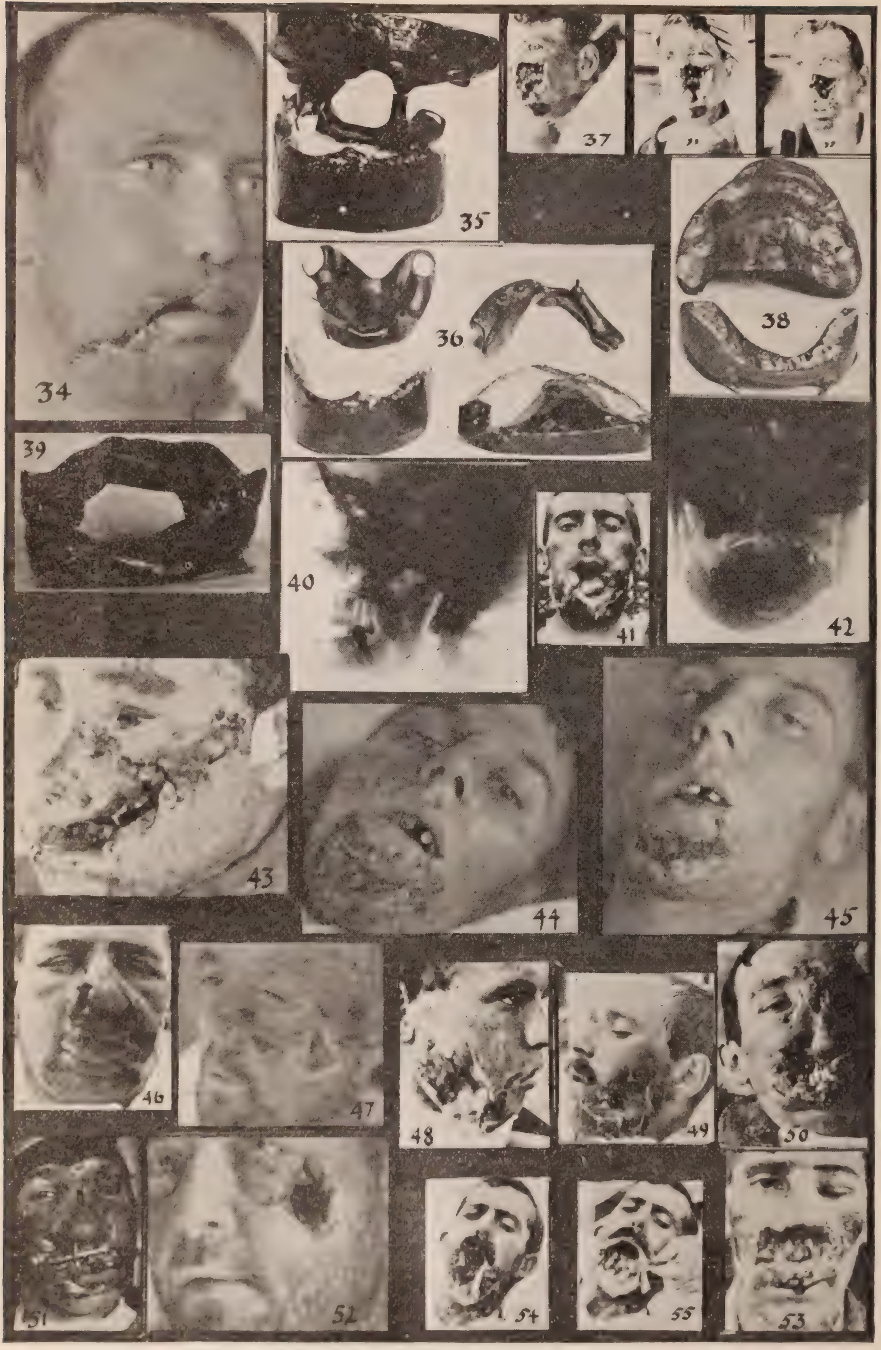


Fig. 35—Showing primary suturing with upper and lower vulcanite splint in position.

Fig. 36—The type of splint used.

Fig. 37—Stretcher bearer with facial mutilations and loss of bony structure.

Figs. 38, 39—Type of splint used in this case.

Fig. 40—X-ray of this case.

Fig. 41—Shot through the upper malar region, crossed the roof of the mouth, striking the jaw on the opposite side.

Fig. 42—Shows fracture at both angles. Luckily he had his two centrals missing. Lower jaw was splinted to the upper with fixed Victoria metal splints.

Fig. 43—Shrapnel wound, involving soft tissues and superior maxillary and orbital.

Fig. 44—Wound of the chin and anterior fractures; loss of anterior teeth.

Fig. 45—After being properly splinted and primarily sutured.

Fig. 46—Soft tissue wound. No damage done to the jaws.

Fig. 47—Shrapnel wounds.

Fig. 48—Showing exit wound.

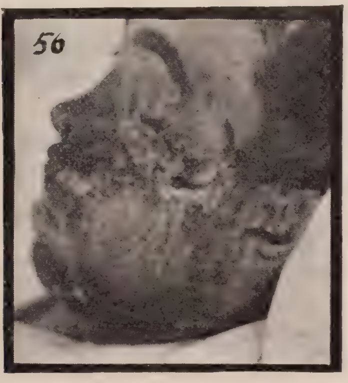
Fig. 49—Explosive type. Entrance on the opposite side.

Figs. 50, 51—Bullet struck the man on the bridge of the nose, exploding and tearing away superior maxillary and badly mutilating soft tissues.

Fig. 52—Entrance of bullet in the sternomastoid, passing through the hard and soft palate, exiting itself at the malar region.

Fig. 53—Portion of a nose, mutilated and paralysis of the right side.

Figs. 54, 55—Chin blown off. The vermilion line in perfect condition.



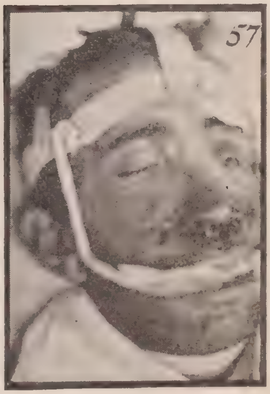


Fig. 56—Struck by piece of shrapnel, tearing out superior maxillary and nasal bones.

Fig. 57—Showing the soft tissues; suture and head splint in position.

As these pictures were taken of the different types of wounds occurring in the hard and soft tissues, fresh from the firing lines, it only goes to show more and more the wonderful work that has been carried on to this late date in reconstruction and with the cooperation of the dentists and surgeons, the desired results can be obtained.

810 Rose Building.

GRAY DAWN*

BY DR. D. E. McCONNELL, GASTONIA, N. C.

SOME, if asked for a simile for the present condition of the dental profession, would look backward and say we were at the zenith of our accomplishment, but tonight I want you to take a forward look with me, so I am speaking of the present moment as the gray dawn of a greater day.

You will notice that I say gray dawn, and I want you to have in mind one of those misty mornings in early spring when he who awakes to see the first faint streaks in the east, finds the earth wrapped in fogs that make the familiar things about us seem strange and unusual.

As we move about on such a morning while our vision is somewhat shortened we are not greatly perturbed as we know that presently the sun will be high in the heavens, these morning mists will dissipate, and the whole beauty of the landscape unfold before us.

If you will ask any observant dentist in what way his profession has changed most in the past few years, he will tell you in its relation to the medical profession.

Our relations with our medical brethren have changed much in the past five years; so much so that they are often obscured by fogs of misunderstanding.

We sometimes hear remarks from both, that might almost be called mutual recrimination, the medical men laying the blame for all the ills that flesh is heir to on the dentists, and the dentists retorting that the physicians are merely "passing the buck," expecting the dentist to cure all the obscure ills that have baffled the medicine man for ages. As a matter of fact, the two professions are nearer together and owe each other more than ever before in the history of the world.

What do we owe the medical profession? Many things. Whether we will or no, our profession is being hoisted into prominence. We are no longer mere fillers of tooth cavities and makers of artificial teeth. Instead we are joined with the medical profession as guardians of the public health.

This is due to the medical profession more than to anything else. They may have done it in part by calling attention to our shortcomings, but we can at least say they have brought us into the limelight by their great interest in focal infections about the mouth.

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*Annual essay read before the North Carolina State Dental Society, 1919.

I will digress here a moment and perhaps intrude a little on the subject of the gentleman who follows me, but I feel that no dentist should lose an opportunity to commend the work of the medical profession, and our last legislature, in passing the laws they did in regard to venereal diseases.

In twenty years' practice I have often had tubercular patients to warn me to take all precaution against disease, but never have I had a syphilitic patient to put me on my guard.

The average syphilitic is a person with no conscience, and will walk into your office with his mouth reeking with poison and care little whether you or your innocent patient contracts the disease.

I thank God that the day is coming when I no longer will have to placard my house if one of my children has mumps or chicken pox, and then have syphilitics walk into my office with no guard except my powers of observation and routine sterilization between them and myself and my patients.

I may speak strongly on this matter, but no more so than I feel. The danger is very real. One of the finest men among my acquaintances in another state had to go through with all that tediuos treatment and suffering because he scratched a finger in extracting a tooth.

We owe the medical profession great thanks for the forward-looking legislation we have, and it will be improved as time goes by.

What will the medical profession owe the dentists? They will owe us much, and part of the payment will be in showing them their deficiencies.

When I hear physicians saying anything about poor dental work and focal infections, I take the plan of General Foch at the battle of the Marne when he said, "My right wing is falling back, my center is hard pressed. I shall attack."

So I ask, What are you doing to prevent these focal infections? Do you not know that ignorance of oral hygiene is the cause of nearly all infections about the teeth? Are you doing anything to spread the gospel of cleanliness? It is amazing how ignorant some physicians are about the teeth. If that is true, what may we expect of the average layman? When we consider the possibilities of the field of dental work and the amount that is done, we see truly that daybreak has not yet come. May I make some statements that will press these things home to you though they may not be complimentary to our state?

Consider this for a moment: Every dentist in North Carolina could have a practice as large as is allotted to a dentist in the army and never one have a patient under ten years of age or one that could read and write. In other words we have about three hundred thousand illiterates and about six hundred dentists.

I make that statement simply to catch your attention so that you may consider how little of the *needed* dental work is done.

Personally I do not believe that, considering the whole population, five per cent. of the needed work is done.

Yet you must admit that in North Carolina almost any man who wants his teeth attended to can get it done.

Why this great difference between the work wanted and the work needed? The answer is twofold: ignorance and poverty, but ignorance is the great cause. Men get what they want if it is in reach of effort. If you will read the *News Letter* from the university in regard to per capita investments in automobiles you will get some idea how men spend money for the things they want.

Green County leads the list with an investment of thirty-six dollars for each inhabitant. If the people had wanted the needed dental work as badly as they did automobiles they could have had it for far less expense.

How shall we attack the great mass of ignorance that lies between the work needed and the work wanted? There lies the work for years to come where we need the help of the medical profession, the pulpit, the schools, the press, and every agency that tends to send out the light of knowledge. If every physician in the state can be converted to the gospel of oral hygiene the layman will not long remain ignorant. They will get a different idea of dentistry and we will not have so many who will look at it as did the citizen of Winston-Salem who told me, "Dr. Conrad Watkins has quit practicing dentistry; he doesn't do anything but clean teeth."

How can we reach the physician? By individual work and by society work. One of the grandest things about medicine is its catholic way of looking at things. It welcomes anything that helps in the great fight against disease regardless of the source, and is bound by no precedent. It asks only that the man presenting a theory shall back it with the proven fact. What an interesting field for co-operative investigation opens up before the two professions.

For instance, I would like to see a long series of cases investigated to see what connection there might be between appendicitis and infections about pulpless teeth. I know canal filling began to be practiced about forty years ago and old people will tell you that appendicitis must have been rare years ago.

I am always glad to hear a physician at our meetings and think there should always be a dentist on the program at the medical society meeting. Never before has there been such concentration of thought and effort in the prevention of disease as during this war. Men in all walks of life are thinking deeply on these lines.

Only a few days ago a minister, an exceedingly clear thinker, said to me, "I sometimes think that I am a socialist along some lines. I believe the dentists and physicians should be endowed or paid by the state so that all could have the benefit of their care."

The world is facing great changes and most of them are in the direction of lessening personal liberty for the benefit of the whole people. Is the day coming when the physical health of the people will be looked on as an asset as much as any other property? I believe it is, and the day will come when the man who has, we will say typhoid, will, instead of receiving the sympathy of his friends, be haled into court on the charge of imperiling the public health.

We think sometimes these great reforms must stop because of the cost, in money; but when we see the wealth of the world poured out as it has been in the past few years we think the thought that Longfellow expressed in his poem on the Arsenal at Springfield, though he was looking at what modern war would call a handful of stuff:

"Were half the power that fills the world with terror,
Were half the wealth bestowed on camp and courts
Given to redeem the human mind from error,
There were no need of arsenals or forts."

A SUGGESTION TO THE YOUNGER MEMBERS OF THE PROFESSION

BY LOUIS F. ROBICHAUX, SAN ANTONIA, TEXAS

(Written for THE DENTAL SUMMARY)

When we attend a banquet or meeting of any kind and hear someone called on for a talk or paper, we often are impressed with the manner in which the subject is handled. If you analyze the speaker, you will find that this knowledge of speaking was not gained at the time but by many efforts, often failures, at an earlier date.

I have a solution to offer in a way that every minute of the time expended will be very profitable. Many hospitals maintain training schools; they have to have teachers; they are hard to get because the physicians are busy and those that are not do not care to put forth the effort to do this work. Now this is the key to the situation: get one of the hospitals to let you teach a subject; select one that will help you in your practice and by hard application this will be a distinct advantage to you; also you will learn to speak before an audience.

A number of years ago I did this and I am now teaching four branches, five nights a week, for six months a year, in four different schools.

Another advantage to be gained from this work is the better opportunity it affords you to become acquainted with the medical profession, as everyone knows that the person who is studying and trying is better able to render service and more likely to succeed than the fellow who spends his evenings wastefully. Of course the direct knowledge gotten from your study will be the greatest benefit to be gained. The proof of the above is to try it.

Central Trust Building.

TOOTH PROBLEMS IN INFANCY—THE RELATION OF DENTAL OPERATIONS TO PREGNANCY*

BY V. B. DALTON, D.D.S., CINCINNATI, OHIO

IN TAKING UP the dental problem of infants, let us first consider the eruption of the deciduous teeth.

The time of eruption of the temporary, or baby teeth, like their permanent successors, varies greatly. Ordinarily the lower teeth erupt a month or two previous to the upper. The two lower central incisors are the first of the deciduous teeth to erupt, and they make their appearance on the average, when the baby is five months old, although often they erupt at a later period and occasionally earlier. Rarely, they are even present at birth. Shortly after the eruption of the lower central incisors, the upper incisors make their appearance. The deciduous teeth are twenty in number—eight incisors, four cuspids and eight molars. Ordinarily at the age of two years all the temporary teeth are erupted and occlusion is established.

These teeth erupt far more harmoniously than their permanent successors, due undoubtedly to the fact that there is little, if any, interference with Nature's plans. Also from the fact that there is no interference from the remains of a previous dentition. The eruption of the temporary teeth, like other processes of nature is purely a physiological one, but there are times when it assumes a pathological aspect requiring surgical interference, although this does not happen so often as is commonly believed to be the case; and I wish to take exception to the practice of some medical practitioners in their too-free use of the lance in gum tissue of infants over their erupting temporary teeth. This practice should be abandoned and relegated to its proper place with the dark ages of the past. Even granting that the erupting teeth are causing reflex disturbances and actual pain in the gums immediately over their crowns, the use of the lance does not afford relief; does not do any good at all. In fact it does a very positive harm as I will try to show later on. Yet there are men in the medical profession who still resort to this evil practice.

The eruption of the teeth like the regional development of the jaws occurs variedly at intervals. There is not one continuous eruptive force; at least there is not continuous response to this eruptive force —whatever it is. There are times when a tooth or teeth are all but showing through the gums; then there will be a let-up in the force producing eruption and there will be no further progress in the way of eruption for weeks or even months in many cases. This may be due to Nature's original plan, or it may be due to lack of necessary nutrition either wholly or insufficient in quantity.

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*Read before the Cincinnati Obstetrical Society and the McDowell Medical Society.

LANCING OF THE GUMS

Now, suppose that the gums are lanced just at this quiescent state, what happens? The gums knit back together where separated, leaving a cicatricial mass of tissue which is a positive hindrance to Nature's efforts subsequently to cause eruption of the tooth in question.

Some of you may say, let us see how it works the other way. Suppose the eruptive force is actively at work and the gums are lanced, what happens? Unless the tooth is practically through the gum tissue and beyond the possibility of benefit from lancing, it will heal back together before the tooth possibly can erupt sufficiently to prevent union of the gum tissue. This scar tissue not only delays eruption of the baby teeth, but what is worse, it causes deflection of the tooth in many cases, resulting in malposition of the temporary teeth; and even though it be very slight, its influence and baneful effects will be felt even to a greater degree in the development and eruption of the succeeding permanent teeth. If it is decided that it is absolutely necessary to use the lance, a small portion of the gum should be removed immediately over the incisal or occlusal surface of the erupting tooth.

TREATMENT OF TEMPORARY TEETH

The treatment of the temporary teeth when decayed, to my mind is one of the biggest problems confronting the dental profession, and sad to say, it is one in which very little progress has been or even is being made. I mean gernerally speaking, for there are a few dentists who are specializing in the care of the teeth of children, and they have accomplished wonderful results. Would that we had more of them. But in the rank and file very little progress has been made along this line and I grant you that it is a big problem; a difficult one to handle satisfactorily.

Dental caries is to the temporary teeth what pyorrhea is to the permanent teeth—a veritable destroyer. In a child's mouth, because of food habits, is found a most favorable place for the formation of plaques on the teeth for the beginning of decay. Lactic acid fermentation within these plaques causes dissolution of the enamel, rapidly followed by disintegration of the dentin. The pulp of the tooth—the so-called nerve which is richly supplied with blood vessels, soon is exposed through the ravages of caries and devitalization takes place, for the pulp of a tooth can not remain vital if exposed. Decomposition rapidly follows death of the pulp with all its train of evils, such as suppurating abscesses, blind abscesses, and putrescency. Small wonder then that a child gets sick and feverish when there is an abscessed tooth or teeth continually discharging pus into the mouth to be mixed with the food or swallowed with the saliva, or what is possibly worse, discharged into the blood stream itself.

The pulpal cavity within the crown of a tooth, which contains the pulp—the formative organ of the tooth—is comparatively larger in the temporary teeth than in the permanent set. This partially accounts for the fact that death of the pulp in a temporary tooth rapidly follows in the wake of decay. The pulpal cavity being larger, the distance from the enamel where decay begins to the pulp itself is not very great. Then too, the dental tubuli, which serve for the transmission of the dental fibrillæ, the fine hair-like processes or projections from the pulp into and throughout the dentin, are comparatively larger in the deciduous teeth. This again explains why decay when once set up in a deciduous tooth progresses so rapidly. It may also account for the prevalence of blind abscesses in the mouths of children. Death and decomposition of the pulp often occurs before this organ actually is exposed, due to thermal changes (shock) which are so rapidly transmitted to the pulp by the large fibrillæ.

By a blind abscess we mean one which does not discharge through the cavity in the tooth, but the smoldering action at the apex is carried away by the blood stream, and when the production of pus is too rapid to be gotten rid of in this way, it burrows through the alveolar process at the apex of the tooth and discharges through the gums, buccally and labially, and sometimes, though rarely, lingually.

Temporary teeth are extremely sensitive. I make this statement with the express purpose of taking exception to those who think that it really does not hurt a child to have a small cavity in a baby tooth filled, and that they cry only because they are afraid of the dentist. The anatomical and physiological structure of the temporary teeth bear out such a statement.

Taking these things into consideration, then, you readily can comprehend that the care of the teeth of children is a momentous question. I wish I were able to point to a happy solution of the problem, but I confess I cannot. Like many another I am condemning practices without offering satisfactory substitutes, but with the sincere hope that it may cause a combined concentration of thought on this subject among practitioners in the medical and dental professions, and that from such there may be evolved a method whereby much suffering may be prevented or at least successfully alleviated.

Probably the greatest amount of good will come through prevention. This can be accomplished only through the closest cooperation of the two professions. A correct understanding of the influence and effects of different foods on the production of healthy resistant tooth structure; the importance of maintaining clean mouths in infants and children, thereby greatly lessening the chances of decay, are possible solutions of the question.

Some say, "Why is it so important to care for the temporary teeth, since they are soon lost anyway?" There are two principal reasons why the deciduous teeth should be kept free from decay. The first is in order to prevent abscesses which endanger the health of the child and lower the vital resistance. No one can deny that this is important, and the second reason is of equal importance, because of the influence on the position of the permanent teeth, and the effect on the size and shape of the dental arches; for, when a temporary tooth becomes so decayed as to necessitate extraction, that is if it occurs (as it too often does) before the time of eruption of its permanent successor, there will be a lack of development in the region where the extraction was made, so that when the time comes for the eruption of the permanent teeth, they are either retarded or wholly prevented, or else are forced to erupt in an irregular way, causing impairment of the permanent denture from a masticating view-point.

Unfortunately the evil does not stop here, for these irregularly placed teeth, although only slightly malposed are more susceptible to pyorrhea through impingement of the peridental membrane, and more readily decay, because they offer favorable lodgment places for food debris. Not only this which is quite enough, but lack of development of the arches results from a crowded condition of the teeth, with a consequent lack of growth in the related facial bones, more especially felt in regard to constricted nasal passages. Mouth breathing, then, is directly traceable to lack of growth of the jaws, and it is not a habit, but becomes a necessity through narrowed and constricted nasal passages. If we can trace, then, a condition of this kind, to malposition of the permanent teeth, we can as readily trace the cause of the crowded condition of the permanent teeth to premature loss through extraction of decayed and abscessed baby teeth. The importance of keeping the deciduous teeth in a healthy state until proper time for their loss cannot easily be overestimated.

THE FIRST PERMANENT MOLAR

Another thing I would like to touch upon in this connection is the mistaken idea which exists in regard to the first permanent molar. This tooth which is the largest and strongest of the permanent set, erupts unnoticed simultaneously or shortly after the permanent central incisors, which teeth take their position in the arches as early as five years in many cases, but on the average when a child is six years of age. This first permanent molar, from the standpoint of occlusion and in many other ways, is the most important tooth in the mouth; and sad to say, is the most neglected of the permanent teeth. Often this tooth is hopelessly decayed before the services of a dentist are requested, and when parents are informed that the tooth is a permanent one, but because of the extent of decay it will have to be extracted, they will exclaim that it must be a baby tooth for the child never lost a tooth in its place.

Now this brings me up to the point I wish to make, and that is that the first permanent molar as well as all the other molars are not succedaneous teeth; that is they do not depend on the shedding of any of the temporary teeth for their presence in the arches. They erupt just distal or posterior to the temporary molars. This explains the principal reason for their neglect, as they unknowingly erupt.

These first four permanent molars are the keystones in the dental arches, and their loss always is followed by lack of development of the jaws and loss of normal occlusal relationship of the other teeth. These teeth through a wise provision of Nature, are normally guided into place and interlock before the loss of the temporary molars, thereby serving as props to hold the jaws apart while the temporary teeth are being shed and their permanent successors are erupted to place. In order to have these keys in normal occlusal relation it is absolutely necessary to preserve the temporary molars until the eruption and interlocking of the first permanent molars has been completed.

RELATION OF DENTAL OPERATIONS TO PREGNANCY

The belief long has existed that a pregnant woman should not have any operation performed upon her teeth. This belief prevails, not only among the laity, but includes the dental profession as well. Just why such belief should have existed so long it is difficult to understand.

Much needless suffering has been caused by this erroneous theory. Possibly there are cases where it would be unwise to undertake more than palliative treatment; but there is no sound reason why the necessary work to get relief should not be done, and by this, I mean more than the topical application of a dressing saturated with an essential oil, or the simple application of tincture of iodin to the gums as a counter-irritant, which while good so far as it goes, yet the results from such treatment can not be lasting, the pain returning sooner or later as violent as ever.

Is it not far less dangerous to the prospective mother as well as the prospective child to have the patient undergo a more radical operation —one which will affect something more akin to permanent relief? Such as surgically opening a tooth or sinus for drainage, or if warranted the extraction of the offending tooth itself. In my work as an exodontist, I am quite frequently called upon to extract teeth for pregnant women, and where necessary I have extracted for such patients and never have I had occasion for regret at having done so. Some of the patients have been as far along as eight months, yet no ill-effects ever developed so far as I know. Of course it was impossible to follow up all cases, but a sufficient number were kept under observation to justify the belief that it is good practice to operate for such patients, thereby relieving their pain and conserving nervous energy, instead of compelling them to use it up to a point of exhaustion.

The work undertaken should be performed with the utmost care, being sure not to inflict pain at any time during the procedure of the work. This is not always an easy task to accomplish, but cavities in teeth which prove extremely sensitive should simply be sterilized and filled with cement, and no attempt made to excavate or remove the decay in its entirety as is done in the ordinary case. Fillings made in this way should easily last until after confinement, when a permanent filling should be substituted.

Freedom from pain is what is to be desired so that development may go on unhampered.

Is it not by far the better plan to give these patients dental services than it is to subject them to the influence of powerful narcotics, which at best can give only temporary relief?

It is a common belief that the teeth are more susceptible to decay during pregnancy. This has not been verified, and personally I doubt it very much. Teeth having cavities of decay are more liable to ache during pregnancy, due undoubtedly to the strain on the entire system. Possibly this gives rise to the belief that the teeth more readily decay during such a time.

People offer all kinds of excuses for being the possessors of bad teeth, more especially is this true with those whose dental troubles have been brought about chiefly through neglect. Persons with salivary calculus (tartar) thickly deposited over the lingual, labial and even the occlusal surfaces of their teeth, which causes many forms of gum diseases as well as diseases of the peridental membrane, will offer that old-time, worn excuse that their tooth troubles have all been brought about by their Doctor prescribing so much iron.

It is unfortunate that the teeth should be so neglected as to require radical treatment during such a critical period in a woman's life.

Undoubtedly freedom from dental ills during pregnancy would have a profound influence in the betterment of the race which follows.

Leverone Building.

INDUSTRIAL DENTISTRY*

BY J. P. BECKER, D.D.S., CINCINNATI, OHIO

CONSULTING INDUSTRIAL DENTIST WITH THE R. K. LE BLOND MACHINE TOOL COMPANY

IN LOOKING at the subject of Industrial Dentistry, the first question which presents itself is, "Where does industrial dentistry belong in the scheme of production?" The improtance of this question lies in the fact that until we have oriented it, until we have assigned it its proper place in the productive process, we are in no position properly to evaluate it either socially or economically. This evaluation is necessary if we are to determine either its present worthfulness or its future development.

Is industrial dentistry merely a phase of welfare work, is it something done for the worker by the employer? If this be all that it is, then its main value will be social and therapeutic; and in attempting to estimate this value we must ask what is its reaction upon the workingman, how does he look at it as a piece of welfare-work and what is its therapeutic value?

Assuming that it is done by skilled and scientifically-trained operators, who have all needed facilities for doing the work, all adjuncts to proper diagnosis and ample time in which to do the work, we may accept its therapeutic value as unquestioned.

But this is only part of its total social value, the other and possibly more important part is the worker's reaction to it as part of what we are pleased to call welfare-work. It is rather important for us in these days of industrial unrest to inquire rather closely as to just how the workingman looks at all this thing which is denominated welfare-work, and in which industrial dentistry may or may not be included.

Pure welfare work, and by pure welfare-work I mean that work done for the employee by the employer and at no expense, either immediate or remote, to the employee, was undoubtedly motived in the great majority of cases by a sense of social obligation upon the part of the employer to the employee, and a desire to do something for the employee in addition to merely paying him an agreed wage. In all of its varied manifestations it has been an attempt to make the life and labor of the employee more safe and comfortable, more pleasant and enjoyable, more happy and satisfactory.

Looked at from the viewpoint of the one instituting and supporting this kind of work, it is altogether admirable, and he naturally feels that he has a right to expect that it will be received by the beneficiary of it and accepted by him in the same spirit in which it is given; and he is not only pained, but also sometimes shocked when he realizes that the employee frequently not only fails in gratitude but is actively antagonistic to the whole idea of welfare-work.

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*Read before the Cincinnati Dental Society, January, 1920.

That the employee does have this feeling of antagonism has been demonstrated repeatedly by both word and deed. In many cases he resents all kinds of welfare-work and in others he resents simply one kind. We will consider this differentiation between kinds of welfare-work later on in this paper, and confine ourselves now to the reason why the employee may not approve of purely gratuitous work done for him by the employer, and we consider his attitude because the social value of the work largely depends upon this very factor. No work can be socially valuable which does not result in the betterment of relations between the one doing it and the one for whom it is done.

If the workingman resents it because he feels that it is unduly paternalistic, or because in the final economic analysis he is really paying for it himself, or because he dislikes having anything done for him without his paying for it, or for any other reason whatsoever, then it is seriously to be questioned as to whether such work is socially valuable and whether it should be continued or discontinued. That the workingman does, in many cases, at least look askance at all welfare-work, even if he be not actively opposed to it, is capable of demonstration by the very simple process of securing the opinion of a sufficiently large number of them to give you a basis for judgment.

If an appreciable proportion of workingmen resent the idea of welfare-work, then industrial dentistry, as a part of this kind of work, has at least a questionable value as far as its contribution to social well-being is concerned.

On the other hand, we may ask, is industrial dentistry an effort upon the part of the employer to reduce the cost of production by increasing the physical efficiency of labor?

If this is what it is, then it is in no sense welfare-work and our criterion for evaluating it must be purely economic rather than social. But whether it be welfare-work or an economic expedient for reducing the cost of production, there is one question which must be asked and answered, for upon our answer to it depends the justification of the workers' attitude, and both its social and economic value as part of the productive process.

This question is, who pays for it, who bears the expense of industrial dentistry as it is generally carried out?

There are at least four possible answers to this question and each answer carries with it different results.

In the first place, industrial dentistry may be paid for by the employer and may be a gratuity to the employee from capital's share of the net product of industry.

If this be the case, then the employee may have grounds for a just resentment against industrial dentistry as being charity, something given to him for which he makes no return, and which places him in the position of one who is the recipient of alms, and he may rightfully resent being placed in this uneviable position, and thus the whole social result of the practice may be harmful. This social harmfulness also would tend to affect adversely any possible economic gain which might result from this particular method of consumption of his wealth upon the part of the employer. A dissatisfied workman is never at the top-notch of his efficiency, and any decrease in efficiency means increase in cost of production, and wherever such increase is unnecessary it is economically unjustifiable. Not only is this true, but it may be possible that the employer may feel that this gratuity upon his part must, at least partly be made up by retrenchment in some other particular or particulars, and this retrenchment may be felt by the workingman as disadvantageous to him and thus, even as a pure gratuity, industrial dentistry may be economically harmful.

In the second place, industrial dentistry may be paid for by the worker, provided the wage fund is reduced by an amount equal to the cost of the treatment.

If this be the case then there is no question as to who should do the deciding as to whether we should or should not have such a thing as industrial dentistry, and the question of its value will be determined by the one paying for it. In this case the workingman must make the decision and must determine whether or not there shall be such a thing as industrial dentistry.

In the third place, it may be paid for by the consumer of the finished commodity, provided the amount thus spent on it is added to the selling price of the article manufactured. Here a new factor enters, *i. e.*, the consumer, and in this case it seems but logical that he should have something to say about whether or not there should be such a thing as industrial dentistry. Surely, if he pays for it, he ought to be given some say-so about whether or not he wants it. But the realization of justice to the consumer is an iridescent dream, and the fact that he pays for a thing has only an academic interest to every one but himself and, besides, he has grown so used to paying that he might even resent a reduction in price as being discriminatory against his ancient and vested right of being forced to pay without having any determinative voice in fixing the amount which he has to pay, or to whom he must pay it.

In the fourth place, it may be paid for by both capital and labor, in case a profit-sharing scheme is in operation and the expense is listed as part of the cost of production. Here three parties should rightfully have some part in determining whether there is or is not to be industrial dentistry, viz., the employer, the employee and the consumer, and the social and economic results will depend upon the answer which they give, and its effect upon any or all of them.

The question as to who pays for industrial dentistry is important because upon the answer to it depends the answer to the other question, as to who should determine whether there shall be such a thing as industrial dentistry. If industry is conducted upon a purely capitalistic basis, and labor has no representation in its control, then, whether this method of conducting production be right or not, the capitalist would be the man to determine whether there should or should not be industrial dentistry. If both capital and labor are represented in the control of industry, then both should have a share in determining the advisability of having or not having industrial dentistry.

If capital, labor and the public have a share in the control of industry, then all three should share in the determination.

Another question which it is worth while thinking about is, who should determine the manner of the administration of industrial dentistry?

Here again the answer depends upon control of industry. It is remarkable how most questions affecting industry do depend upon this question of control, and how slow we have been to realize that this is the case and to take it into consideration in our thinking about things.

If the capitalist exercises exclusive control over industry he would normally determine the administration of everything connected with industry. His determination would of course be affected, if he were wise, by the advice of experts and the psychologic reaction of labor to the plan.

If labor shares in control, then labor would share in determining the manner of the administration of the scheme.

The whole thing comes back to the question of control and this matter of control is basic and fundamentally important, for if it be overlooked, friction and misunderstanding are bound to result, and to the extent that either exists there will be an interference with the smooth and easy working of any plan for either social or economic improvement.

You will find too, I believe, that the question of control affects the attitude of labor to all questions which have to do with welfare-work or with anything else which affects him in his industrial relationships.

What is labor's attitude toward the whole question of industrial dentistry?

If industrial dentistry be merely a phase of welfare-work and not charged against the cost of production, I believe that many workingmen will resent it because of its charitable implications, and because they feel that they should have a voice in determining whether or not it should be put in practice because they are the ones most directly affected.

If it is an effort to reduce the cost of production by increasing the physical efficiency of labor, then I believe that many workingmen will resent it because it savors of the idea that labor is something separate and apart from the man, and that its efficiency or non-efficiency is to be determined without consultation with the man who supplies the labor. This may be a shortsighted view upon the part of labor, but the fact remains that the laboring man firecely resents anything which tends to depersonalize labor.

If it is a phase of welfare-work and is charged against the cost of production, then the laboring man has the right to question its installation, because it must be paid for out of the totality of returns from which all costs must be paid and from which all profits and wages and rents and salaries must come. Any deduction from this totality he looks upon as being in part a deduction from what might otherwise have gone to increase the wage fund.

If there is non-profit sharing scheme in force in the industry, then the laboring man looks upon all welfare-work as probably being paid for largely by himself and feels that if it were not in existence, there would be more money for wages and it is in wages that he is most vitally and constantly interested. Therefore he resents welfare-work.

If there is a profit-sharing arrangement of any kind, then the laboring man feels that he is entitled to have a voice in the determination of policies which involve the expenditure of money earned by the industry, for every dollar spent which does not mean an increase in production results in diminishing the profits and consequently in decreasing labor's share.

All these questions have a direct bearing on the subject as to whether industrial dentistry is either socially or economically justifiable as it is conducted today, and our judgment on the broader subject will depend upon the answer which we give to them, but there is a still more fundamental question which it behooves us to consider rather carefully, and this is a question which strikes directly at the root of the whole matter and raises the issue as to whether it is right that private industry should be burdened with conserving the health of its employees by giving them dental attention, or is it a legitimate function of the state to do this, and this is but a phase of the yet larger question as to whether all health measures should not rightfully be under the immediate direction of the state and supported and paid for by the state.

If private industry looks after the health of its employees and spends thereon large sums of money, and this result cannot be accomplished without spending large sums, then the consumer ultimately pays for it, provided that it does not so reduce the cost of production as to render the finished commodity cheaper in the open market.

As to whether or not it does reduce the cost of production to such an extent as to pay for itself is a question to be decided in each individual case by a careful examination of costs.

If it does not so reduce the cost of production, and the additional cost involved is charged against the selling price of the commodity, then the consumer is taxed without his assent for a benefit conferred upon but a part of the people, and in which he does not share except as an unwilling and involuntary disbursing agent. It is open to question as to whether this is right and just.

The consumer rightfully resents the idea that he is being exploited in order that additional advantages may accrue to the employer and he is growing increasingly restive under the pressure of rising prices. Is there any difference in principle between the exploitation of the consumer for the benefit of the employer and his exploitation for the benefit of the employee? And, unless industrial dentistry result in an economic gain, is it not a charge against the consumer in favor of the employee, provided that the total cost of it is not borne solely by the employer or shared in its entirety between the employer and the employee?

After all, is not the only equitable and just solution of the whole problem for the state to take over all matters concerning the health of its citizenship? The state is already exercising numerous health functions and the tendency is toward their constant extension and expansion. We have boards of health which are constantly enlarging the scope of their work; we have great public hospitals where the poorest in the land can have treatment and care which is possible only to them and to the very rich; we have public food inspectors; we exercise public control over contagious diseases; we insure an adequate supply of pure water, sometimes at great expense; we have public health stations and public district physicians and free clinics of various and sundry sorts.

The increasing functioning of the state along these lines has come about as a result of an enlightened public demand, and the public is becoming increasingly ready and willing to bear the necessary burden of taxation incident to their support, provided that it be convinced that the work is being carried on both efficiently and economically. These are comparatively new functions and have but recently been taken over by the state from the hands of private enterprise. Their development is more or less paralleled by that of the public school system. There was a time when the state was willing to entrust the mental health and development of its future citizens to the hands of private individuals who operated schools for the benefit of those able to pay for the education of their children. The system of private schools for elementary education has been almost completely discarded and no one would now be so foolish as to suggest that we revert to it. We are satisfied that education should be a function of the state, and if the insurance of a sane, normal, mental development logically belongs to the state, and if the state has demonstrated its fitness to assume this burden for all of its citizens, then why not assume the simpler and equally important function of, so far as it is scientifically possible, assuring the health of all of its citizens?

Dr. Charles Mayo says most of the diseases from which we suffer are but symptoms arising from primary foci of infection found in the oral cavity, and nine out of ten will die from a streptococcus infection.

The late Dr. Osler has said that oral infection has done more harm to humanity than strong drink. These conditions arise from a lack of knowledge of oral and general hygiene, which we believe can be to a great extent corrected by properly-imparted instruction. The free dental clinic secured the services of an expert teacher of oral hygiene, Dr. Salmons, whose work during the past winter has been the means of arousing an increased interest among those who formerly gave little thought to the dangers arising from pathological conditions of the oral cavity.

In my opinion public health is of coequal importance with public education and most intimately connected with it, and if the one be entrusted to the state, so should the other.

We seek to restrain by legal enactment the practice of dentistry by those not properly educated and we provide public examining boards for those who desire to enter this profession. This in itself is an admission that the state is concerned with the health of its citizens and that it admits its responsibility and assumes its obligation.

Why not take the last step in this logical progression and have dental education paid for by taxation, and given by competent, scientifically-trained dentists who shall be responsible to the state for the proper performance of their duties?

When this is done, all dental welfare-work will become a thing of the past and industrial dentistry will be but a phase of public dentistry, and the burden will be borne by all the people, for we shall recognize that all the people have the right to expect and demand from a democracy that it shall make itself responsible, so far as is humanly possible for the physical as well as the mental health and well-being of all of its citizens.

3602 Eastern Ave.

Formula for Sensitive Dentin

Zinc chlorid, twenty grains; four drams each of alcohol and chloroform. This is not a panacea for all cases; but in large cavities, in molars and bicuspids, which approach the pulp, its use is very gratifying. The alcohol is necessary to effect a solution.—*Elmore W. Elliot, Dental Facts.*

Retaining Cotton Rolls

The problem is to keep the rolls in place, particularly in the lower jaw, where the tongue always has a tendency to toss the rolls out of position. This may be obviated by slipping an ordinary rubber dam clamp over the tooth after the rolls are in place, allowing the beaks of the clamp to grasp a small portion of the roll between the clamp and the tooth. This will hold the roll securely and will also prevent the clamp from hurting.—*Ed., Dental Facts.*

INDUSTRIAL DENTISTRY*

BY CAREY P. MCCORD
UNIVERSITY OF CINCINNATI

INSTEAD OF CONFINING OURSELVES closely to the topic of "Industrial Dentistry," it will be a matter of greater profit to us to consider the general problem of the health of industrial workers, and measures necessary for the health conservation of these workers, of which "Industrial Dentistry" is an integral, but largely undeveloped, part.

THE SCARCITY OF INDUSTRIAL WORKERS

This country is essentially an industrial country. Forty millions of our people are engaged in industrial activities. Industry has doubled itself in this country during the last fifteen years. Further growth is still needed and desirable, but is hampered through the lack of industrial workers. A generation ago and less there existed an abundance of industrial labor. For every job there was usually more than one applicant. Managements even in selecting their lowest type of workers usually were able to exercise choice in the matter.

Such an abundance of labor no longer obtains. Although our population has increased, industry has increased much more rapidly. Now instead of there being two men for every job there is not even one. During the past decade industry has sought to adequately man its plants through a diversity of means. One means was through the development of man-replacing machinery. Such a measure necessarily has limitations beyond which it is not possible to substitute machines for men.

In the search for labor, inducements were offered to hundreds of thousands of foreigners to come to this country to engage in industrial work. More recently overtures have been made seeking to obtain the services of women in industry in large numbers.

No one of these measures, nor all together, have been sufficient to stop the increasing shortage of labor.

At the present time we are in another phase of activities on the part of industrial management to adequately fill their plants. This takes the form of competition between plants for the services of labor. This competition assumes a variety of forms in diverse plants and localities. Its fundamental is to be found in making the working conditions, or some aspect of the general working environment, so attractive that workers will spontaneously come to this plant to work. In certain plants this competition takes the form of high wages, in others of bonuses, in others profit-sharing systems, in others shorter hours, etc. At best such measures are to be regarded as "patent medicine" treatment, as they do not offer any hopeful outlook for the solution of any industrial labor problems.

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*Read before the Cincinnati Dental Society, Jan. 23, 1920.

HUMAN CONSERVATION

In the midst of these competitive measures there has developed, in recent years, a fuller appreciation of the genuine values for all concerned that are to be found in honest, straightforward measures for the conservation of the health of the worker. The need of such measures and the values that are to be found therein, are becoming recognized by the workers themselves, by labor organizations and by industrial managements. It also is recognized by public health workers everywhere that the organization and conduct of industry are such as to offer a splendid vehicle for the application of preventive medicine in all of its aspects.

Every industrial plant contains conditions under which work is performed that are neither conducive to full production for the amount of energy expended by the worker, nor to the health, well-being and long continuation of work on the part of the worker himself. A full knowledge of these deleterious conditions and measures for their eradication have not obtained in the minds either of the workers or the management. Although health hazards have existed in a large number of ways, such as fatigue, overcrowding, faulty ventilation, overheating, poor ventilation, and faulty posture, the doctor rendering service to plants has largely concerned himself with the treatment and care of the sick and injured who found their way to the plant's medical office.

Although ninety-eight per cent., or thereabouts, of all industrial workers have mouth conditions that are detrimental to their working efficiency, neither industrial management nor the dental profession has been alert to this need, and to the benefits accruing to all from the application of simple and well-known measures.

Very slowly professional groups and industrial managements are coming to see that their plant needs the services of a human maintenance department, a human conservation department, a human repair department. Such a group, in order to obtain the best results, should be comprised of some or all of the following specialized workers: A trained industrial physician, an industrial dentist, industrial nurses, safety engineers, personnel relations manager, etc.

THE FUNCTION OF THE HUMAN CONSERVATION DEPARTMENT

It is difficult for doctors, for dentists and similar groups to get the viewpoint of industrial managements with reference to their attitude towards their workers. Industrial physicians and dentists, to be of greatest value in industry, must come to realize that they can best serve both the worker and the management of industry by compromising some of the theoretical aspects of medicine and dentistry, and meeting more than half way the conditions that attend industrial production.

Industrial physicians and dentists must realize that production is the chief need of industry; that in the shoe factory the chief end to be attained is the manufacture of shoes; if pumps are being made, the chief aim is the production of pumps. In any such plant the health of the workers is significant and important only in that it is a factor in production, and in the advancement and economic betterment of the workers.

To a great extent production is dependent upon the health of the workers and the conditions under which they work. In the majority of plants in this district and in this country a careful investigation reveals that there are few measures in operation for disease and accident prevention; that there is a general lack of adequate medical and surgical care; that work is done in overcrowded and unsanitary working places; that in many places low wages still obtain as well as long hours, and that no educational measures exist leading to healthier working and living conditions. As a necessary result production is brought about by unhealthy and inefficient working forces, subject to many accidents and much disease. General dissatisfaction and discontent lead to widespread low morale throughout the plant. Labor turnover and absenteeism necessarily will be high, and expensive to the management. Production based on any such human foundation cannot but be low in quantity and low in quality.

It is the function of this human conservation department to work within this field of bad conditions indicated above; to change this flimsy human foundation of production to a stable and enduring one, which can be accomplished through the institution of disease and accident prevention measures, plant sanitation, educational measures in personal hygiene, the proper selection and placement of men on jobs, the best of medical and surgical care for the sick and injured, and through widespread educational measures in topics pertinent to the health and well-being of the workers.

Such a human conservation department will lead to healthy and energetic working forces—men and women giving full time to their jobs with little time lost through accident and disease, ultimately leading to maximum production by experienced, intelligent, healthy and loyal employees.

In short the functions of the human conservation departments are:

First, to hire physically and mentally fit men and women.

Second, to see that they are placed on jobs for which they are physically, mentally and temperamentally fitted.

Third, to protect these workers by maintaining plant conditions free from health hazards.

Fourth, to keep these workers continually on the job by maintaining their health and efficiency.

THE INDUSTRIAL DENTIST

In the activities of this group the services of the industrial dentist are very badly needed. The most common of all health hazards in industry are those growing out of faulty mouth conditions. More than ninety per cent. of all workers present oral defects, obviously handicapping them in their work.

It is at once to be recognized that industrial dentistry in its application is not unlike any other form of dentistry. The greatest difference between industrial dentistry and the dentistry applied in the downtown office is to be found in the viewpoint of the dentist. The viewpoint of the industrial dentist is apparent in the following definition of "industrial dentistry:"

"Industrial dentistry" is the application of the theory and practice of dentistry to industrial workers in order that they and their employers may enjoy the full benefits of continuous health and work.

The advent of dentistry to industry, however, is so recent that no general agreement exists as to what work should be carried out in the plant by the dentist, or the conditions under which this work should be performed.

In 1914, only about twenty industrial concerns in this entire country utilized the services of dentists in their plants. In 1919, fifty-five plants were known to maintain industrial dental clinics. At that time and thereafter the number was growing so rapidly that no records are available at the present time as to the number of plants employing such services or the types of service rendered therein. It is to be pointed out that at the outset of such activities many errors were made. There was no background to serve as a guide, and this period of pioneer work was necessary in order to form a background for guidance. In earlier days various systems were in effect for the application of industrial dentistry.

First, it was found that certain dentists were employed on a full-time or part-time salary; that all equipment and all supplies were furnished by the company, and all service to employees was without charge; the dentists being paid for the time occupied in carrying out dental work. Under such arrangements it was found that the following three classes of work was done:

A Examinations and prophylaxis; all types of fillings, extractions, crown, bridge and plate work—all free to the employee.

B Examination and prophylaxis only, with the necessary dental work of other nature referred to outside dentists under the supervision of the industrial dentist.

C Educational work and examination only, all work being done by dentists on the outside.

Second, dentists employed by industries at a small salary with full equipment supplied and maintained by the company. The dental work was carried out at the expense of the employee but on company time. Here again a wide variety of arrangements were found to exist.

Third, arrangements made by the industry with some nearby outside dentist who supplied dental service of all kinds at reduced rates to the company or to the employee.

At the present time it is practically agreed that the function of the industrial dentist should be limited to the following things:

First, educational work in oral hygiene.

Second, examination and prophylaxis.

Third, emergency filling and emergency work of all kinds.

Fourth, Participation with the doctor in the physical examination of all employees.

Fifth, the supervision of dental work of employees which is carried on by dentists outside the plant.

THE VALUES OF HUMAN CONSERVATION

Each year through ill health or injury every worker loses on the average of eight days. When this figure of eight days is extended to include forty million workers, it means that more than 875,000 years of work is lost each year. No less than seventy-five per cent. of this loss is avoidable, is unnecessary, is preventable. Already in many places the incidence of accidents has been cut down eighty per cent. through the careful application of safety measures. Just so ill health, resulting in lost time, loss of money, and disruption of production, can also be largely eliminated. Widespread ill health results in high labor turnover and high absenteeism. In large American cities the labor turnover averages two hundred per cent. per year. This means that in any plant employing one thousand workers, it is necessary to hire, fire and replace, for all causes, two thousand workers in order to continually maintain a force of one thousand persons. The cost of hiring and firing and training workers is tremendous. For each turnover the cost is not less than sixty dollars. If this figure be applied to two hundred per cent. of labor turnover in the one-thousand-man plant, it represents an item of $120,000.

The right type of work on the part of a human conservation department will throw around the workers such conditions in certain industries as will reduce labor turnover to approximately fifty per cent. or one-fourth of that which obtained before the institution of a human maintenance department. This item alone represents a saving of $90,000, which far exceeds the total expense for an entire human conservation department.

It is estimated that if what we know at the present time about health conservation were widely applied, we might expect to add fifteen years of life to the average life of every person. The worker today is not so shortsighted as to overlook the advantages of such measures made in his interest, for any such measures to be profitable to the manufacturer must be applied to the worker and primarily benefit him. Although such things do primarily benefit the worker, ultimately they lead to splendid returns to the manufacturer himself.

Eden and Bethesda Aves.

WE CONDUCT A MOUTH HYGIENE CAMPAIGN

BY J. W. SIEGFRIED, DAYTON, OHIO

CHAIRMAN ORAL HYGIENE COMMITTEE, THE MIAMI VALLEY DENTAL SOCIETY

Co-operation is the soul of success, and it never has been so well exemplified as in the mouth hygiene campaign which we conducted during the week of May 2nd.

We decided to conduct a militant campaign for the prevention in children of the ills that our adult flesh is heir to. One of our boys made a money-raising speech (think of that!) to the society at our February meeting, and got $300.00 from the fellows. We succeeded in raising $300.00 more from our big industrial plants, namely, The National Cash Register, The Delco, The Malleable Iron Co. and The Davis Sewing Machine Co.

We immediately employed a publicity agent who is very clever at reporting our doings for the laity, and throughout the campaign there appeared notices, often written in story form, a la R. P. McGee, as well as the purely news items connected with our efforts, all totalling several hundred inches.

We arranged for several thousand pamphlets detailing in simple form the time of appearance of the teeth of both sets. This pamphlet prepared by Dr. H. M. Brewer, of the N. C. R., was printed and given us by that company, together with a thousand window display cards described below. The pamphlets were given out to the school children to be carried home to their mothers; yet they are so well arranged that any third grade child may read and understand. They were distributed through the schools by the efforts of Dr. Harvey Huffman of the school clinic and president of the local society.*

The placards for window display—for we enlisted the druggists and department stores in this—were distributed under the direction of Drs. W. B. McBain and A. J. Lewis by the Boy Scouts. Some of them read as follows:

Few kids have perfect teeth; all kids may have clean teeth!

Whose teeth are you going to wear in 1950, your's or the dentist's?

Your mouth—clean up or shut up!

Would you leave mashed potatoes and gravy on your face all night? You clean your teeth!

Jimmy's teeth were bright and clean,
Billy's always dirty;
Jimmy kept his all his life,
Billy's gone at thirty!

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*Those interested may have copies of this pamphlet "Your Children's Teeth" by applying to the Dental Dispensary, National Cash Register Co.

Twenty baby teeth, thirty-two second teeth—how soon will you be back in the baby class?

The first tooth of the second set
Come at the age of *six*.
If cleaned like mother cleans your ears
'Twill never need a *fix*.'

The latter four were also used as slides and exhibited in the thirty moving picture theaters of the city.

We had Drs. E. J. Tizzard and H. A. Penfield working a speaking program for the luncheon clubs and other organizations which we could reach, when we learned that we could secure Major Leonard Mitchell formerly of the Surgeon-General's office, and the army mouth hygiene film "Come Clean" for the week. He came, saw and conquered!

Major Mitchell spoke to about ten thousand people (mostly school children) making sixteen speeches in all. The fact that he is in uniform and has a lovable, kindly and convincing manner insures him a respectful hearing before any type of audience. The high school kids especially couldn't get enough of him and at the three high school assemblies his words were certainly potent for the advancement of mouth hygiene.

It is unfortunate that the government which spends millions for the prevention and elimination of the Japanese barberry and hog cholera for instance, cannot appropriate a measly $20,000 or $25,000 a year to send men of Major Mitchell's caliber over the United States in an effort thereby to prevent half the ills that we die of before we reach fifty!

I have reported this in the hope that other societies which may be interested in a campaign of prevention may have the benefit of our experiences. But let me say, first achieve co-operation in your ranks, eliminate jealousy and useless argument and your society can then accomplish anything.

925 Dayton S. & T. Bldg.

Stiffening Canal Points

Gutta-percha canal points may be stiffened to any degree desired, and at the same time rendered sterile, by using tincture of iodin in glass point container. Flow iodin over points just enough to color them, but not to cover them. Allow to evaporate. Point in twenty-four hours will be ready for use. If not stiff enough to suit repeat until point is dark brown. Iodin crystals seem to vulcanize the gutta-percha and form a coating, rendering the points sterile under almost all conditions.

—*A. R. M., Dental Digest.*

FUNDAMENTALS OF OPERATIVE DENTISTRY*

BY W. H. O. MCGEHEE, M.D., D.D.S., CLEVELAND, OHIO

PROFESSOR OF OPERATIVE DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND SUPERINTENDENT OF CLINICS IN THE DENTAL SCHOOL OF WESTERN RESERVE UNIVERSITY.

PREPARATION OF CAVITIES CONTINUED

IN THE PRECEDING CHAPTER, the steps in cavity preparation were outlined and due consideration was given to the outline form, the first of these procedures. Although there is frequently an overlapping of the steps during the performance of the various technical manipulations and sometimes a reversal or change in the order of performance is deemed advisable, due to the conditions under which the operator is working, it is important that these steps be constantly kept in mind, and that each one be made as nearly correct as possible, if a perfect result is to be obtained.

REMOVAL OF THE DECAY

The next step to be considered is the *removal of decay.* Although during the performance of the first step, viz., establishment of the outline form, much of the carious matter will be removed, it should be done, not with that idea primarily in view, as is so frequently the case with inexperienced operators, but it should be merely incidental to the operation of placing the cavity margins in their proper location.

During the progress of caries, decalcification by lactic acid precedes invasion by micro-organisms. This being the case, the deepest portion of the dentin may have been "*affected*" to some extent, though not necessarily decayed and "*infected.*" Discoloration also frequently precedes the process of decay. Therefore, the dentist is in some instances justified in leaving portions of discolored or partially *affected* dentin on the walls of cavities to avoid possible exposure of the pulp. In such cases the cavity should be thoroughly sterilized. However, in every instance it is necessary to remove the smallest trace of infected and decayed dentin to prevent the continuance of decay under the filling and to avoid irritation and inflammation of the pulp.

The *method of removal of decay* depends on the character of the tissue, the size and location of the cavity and the sensitivity of the dentin.

First, Shallow Cavities on Exposed Surfaces. The dentin is usually very sensitive in these cavities. Remove it with hatchet or hoe excavator, or the round bur. Do not temporize, but make decisive cuts, removing the decayed matter as quickly and in as large bulk as possible.

Second, In Large Cavities With Soft Decay. Use spoon excavators,

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(*Continued from page 793, SEPTEMBER SUMMARY).

first flaking up the decay around the margins and then peeling it off in layers, avoiding pressure.

Third, Hard Dark Brown and Black Decay. Use spoon excavators. The round bur may also be utilized, but never in close proximity to the pulp.

Dentin is usually most sensitive at the dento-enamel junction. Two reasons are given for this, viz.:

First, a nerve is always most sensitive at its termination. The dentinal fibrillæ, though not true nerve tissue, have practically the same functions.

Second, on the surface of the dentin there is an extensive network or anastomosis of the dentinal fibrillæ, with the result that, when one fibril is touched or cut, the sensation is transmitted not only by that individual fibril, but is reflected along the anastomotic network to other fibrils, thus making a greater impression on the nerve fibers in the pulp, from which it is transmitted with redoubled force to the receptive centers in the brain. The latter is the largely accepted theory.

GIVING THE CAVITY FORM

These procedures apply to the internal parts of the cavity and may be divided into (a) Convenience Form; (b) Resistance Form; (c) Retention Form.

229. Define *Convenience Form.*

The shaping of the cavity in such a manner that it may be most conveniently seen, approached, and filled with instruments.

230. Is the *Extension* of cavity margins for *Convenience Justifiable?*

Slight extension of mesial, buccal and lingual margins for this purpose is occasionally admissible. The extension of labial margins is prohibited for esthetic reasons.

231. In addition to extension of margins, *What Other Procedure* is considered admissible for convenience?

Deepening, or making more acute, one or more point angles, for convenience in starting gold. These are known as convenience angles or points.

232. Define *Resistance Form.*

The so shaping of the walls of the cavity that they may be best enabled to withstand the stress brought to bear on the filling during the act of mastication.

233. To what *Amount of Stress* are teeth frequently subjected?

Dr. G. V. Black perfected an instrument invented by Patrick and Dennis, known as the *gnathodynamometer* for measuring the strength of the bite. In a tabulation of one thousand persons examined with this machine, the average force exerted was one hundred and seventy-one pounds on the molars, less on the bicuspids, and still less on the incisors. In an examination of fifty persons ranging in age from four and one-half to forty-five years, it was found that the strength of the bite on incisors ranged from thirty to one hundred and seventy-five pounds, while on the molars there was a variation of from forty-five to two hundred and seventy pounds. Another appliance known as the *phagodynamometer* has been utilized to test the force required for crushing food stuffs. With this instrument beef steak is shown to require a force of from forty to eighty pounds, stick candy ninety to one hundred and twenty pounds, gum drops two hundred and fifty pounds, some bread crusts three hundred and fifty pounds.

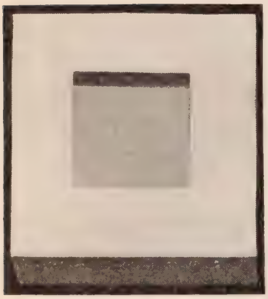


Fig. 91

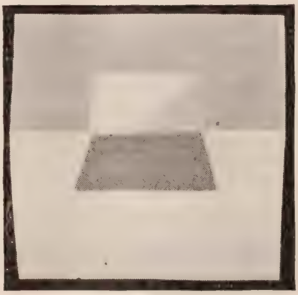


Fig. 92

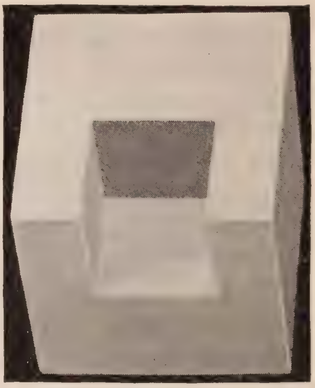


Fig. 93

Fig. 91—The simple mortise on one surface.
Fig. 92—The simple dovetail mortise on one surface. The plaster block and mortise have been sawed in half to show the internal form of the mortise.
Fig. 93—The simple mortise on two surfaces.

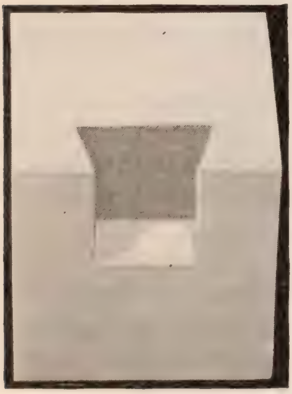


Fig. 94

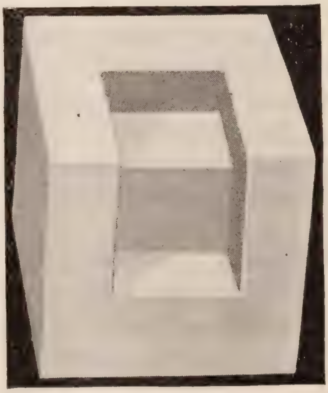


Fig. 95

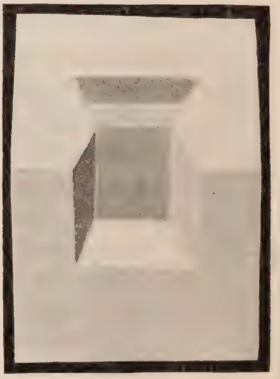


Fig. 96

Fig. 94—The simple dovetail mortise involving two surfaces.
Fig. 95—The compound or double mortise (step form).
Fig. 96—The compound or auxiliary dovetail mortise.

234. Are *Pulpless Teeth* subjected to the same amount of stress as vital teeth?

No; individuals seem naturally to avoid subjecting them to excessive stress; hence ideal resistance form in these teeth may occasionally be not so important as in normal teeth.

235. What *Form is Given Cavities* to enable them best to stand the stress to which the fillings are to be subjected?

In resistance form the general shape of the cavity is the box or mortise form. In this form all of the walls of the mortise are on plane or straight lines, joining at definite line and point angles. This general idea is followed out in mechanical procedures in other callings, hence its adoption in cavity preparation. The adoption of this form is advocated for several reasons, viz.:

First, the seat for the filling is thus placed at a distinct right angle to the line of stress, a condition which is considered ideal in all construction work.

Second, gold and other filling materials are most readily adapted against plane surfaces.

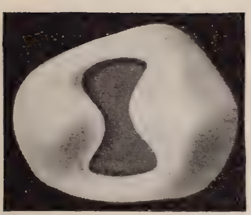


Fig. 97

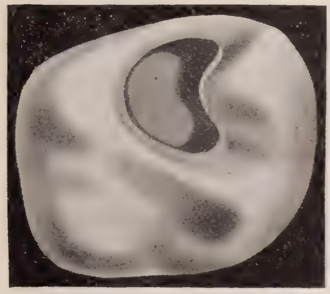


Fig. 98

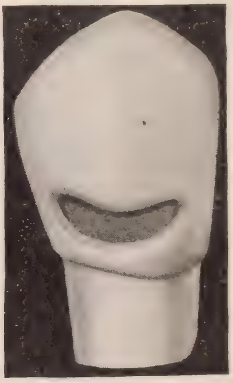


Fig. 99

Fig. 97—Occlusal cavity on an upper bicuspid. A modification of the simple mortise form on one surface.

Fig. 98—A cavity in the central fossa of an upper molar. An adaptation of the simple mortise form on one surface.

Fig. 99—Gingival third cavity on the labial surface of a cuspid. The simple mortise form.

Third, the tendency to splitting away of the buccal and lingual cuspal elements in bicuspids and molars is thus greatly diminished, the filling otherwise acting as a wedge.

Fourth, the cavity is thus rendered more accessible to view and further operative procedures.

Fifth, the properly-wedged filling is thus most securely gripped in place by the normal resilience or elasticity of the dentin.

236. Name the *Mortise Forms* used in cavity preparation.

First, simple mortise on one surface. (*Fig. 91*).

Second, simple dovetail mortise on one surface. (*Fig. 92*).

Third, simple mortise involving two surfaces. (*Fig. 93*).

Fourth, simple dovetail mortise involving two surfaces. (*Fig. 94*).

Fifth, auxiliary, compound, or double mortise. (*Fig. 95*).

Sixth, auxiliary or compound dovetail mortise. (*Fig. 96*).

237. Give *Five Rules* for obtaining *Resistance Form.*

Rule 1. In the shaping of all simple cavities, adopt the simple mortise or box form, or some modification of it. (*Figs. 91, 92, 97, 98, 99, 100, 101, 102 and 103*).

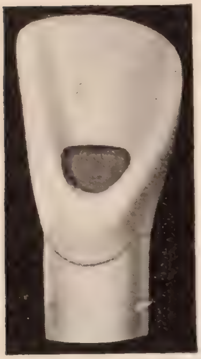


Fig. 100

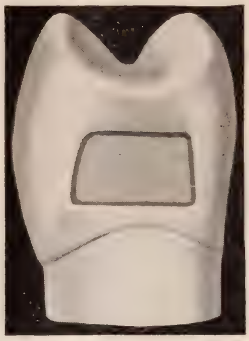


Fig. 101

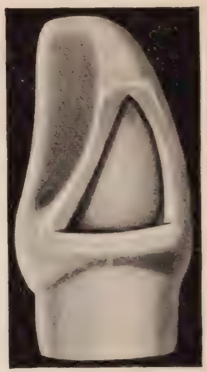


Fig. 102

Fig. 100—Use of the simple mortise form in a cavity in the lingual pit on an upper lateral.

Fig. 101—Use of the simple mortise in a cavity on the proximal surface of a bicuspid. A form very rarely indicated. In the majority of instances the cavity should be extended on to the occlusal surface.

Fig. 102—Cavity on the proximal surface of a central incisor. The simple mortise form.

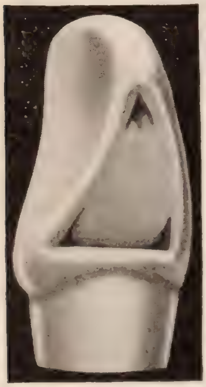


Fig. 103

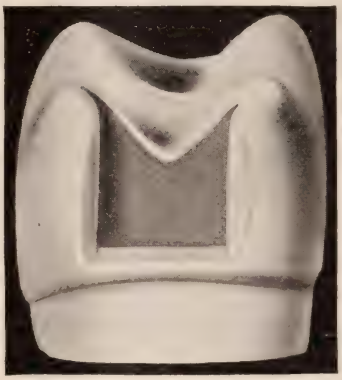


Fig. 104

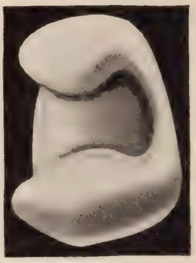


Fig. 105

Fig. 103—A proximal cavity on a central incisor. The simple mortise form.

Fig. 104—Simple mortise form on two surfaces. Disto-occlusal cavity on an upper molar. A form rarely indicated.

Fig. 105—A proximo-occlusal cavity in an upper bicuspid. The compound mortise form.

Rule 2. In proximo-occlusal cavities on bicuspids and molars, where the strength of buccal and lingual walls will permit and there is no decay on the occlusal surface, use the simple mortise form involving two surfaces. (*Fig. 93, 94 and 104*).

Rule 3. In proximo-occlusal cavities in other cases than the above, use the double, compound, or auxiliary mortise form (step form). (*Figs. 95, 96, 105, 106, 107, and 109*).

Rule 4. In proximo-incisal cavities, where the loss of the mesio- or disto-incisal angle is not extensive and where the stress of mastication is not great, use the simple mortise form.

Rule 5. In proximo-incisal cavities, when the involvement of the incisal edge is extensive, use the double, compound or auxiliary mortise form, either in the shape of an incisal step or a lingual step form. (*Figs. 95, 96, 112, 113, 114, 118 and 119*).

238. What *Instruments* are used for obtaining the box or mortise form?

Instruments which cut plane surfaces, such as inverted cone burs, hoe and hatchet excavators. Round burs, spoons and instruments which cut concave surfaces have no place in the preparation of resistance form.

239. Describe the *Technic for Resistance Form in Pit and Fissure and Gingival Third Cavities.*

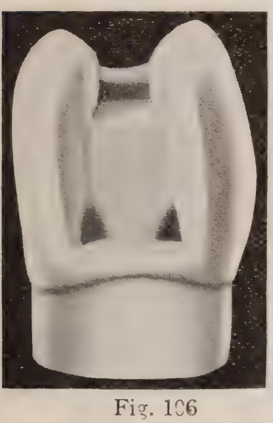


Fig. 106

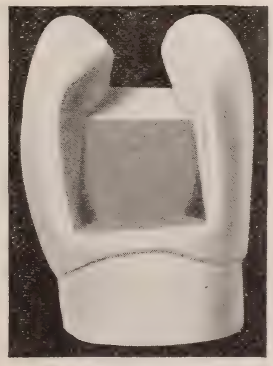


Fig. 107

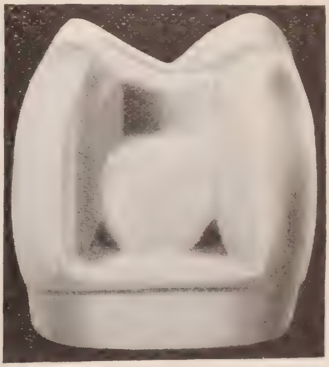


Fig. 108

Fig. 106—Another view of the cavity shown in Fig. 105.
Fig. 107—An M. O. D. cavity in a bicuspid.
Fig. 108—A proximo-occlusal cavity on an upper molar. The step form.

With inverted cone and fissure burs or hatchet excavators and chisels, flatten the pulpal wall or curve the axial wall to follow the convexity of the underlying pulp chamber as the case may be, and true up the lateral walls until they are plane surfaces, parallel with each other and joining with the pulpal or axial wall (the seat) at definite angles. (*Fig. 97, 98, 99 and 100*).

240. Describe the *Technic for Resistance Form* in cavities in the *Proximal surfaces of Incisors and Cuspids* not involving the angle.

Use inverted cone burs, hatchet and hoe excavators and chisels. Flatten the gingival and axial walls, making a definite line angle at their junction. The axial wall should follow the convexity of the underlying pulp chamber in a labio-lingual direction. Bring the axial, gingival, labial and lingual walls together at two definite point angles (labio-gingivo-axial and linguo-gingivo-axial). Make a definite line angle at the junction of the labial and lingual walls with the axial. The axial wall should follow the curvature of the pulp chamber labio-lingually. Join the labial and lingual walls together at a definite point angle at the incisal portion of the cavity, the resultant form being triangular in shape, with three definite point angles. (*Figs. 102 and 103*).

241. Describe the *Technic for Resistance Form* in cavities of the above character which involve the angle.

A *If the stress of mastication is not great* and the angle not much involved, the procedure is practically the same as that described in the answer to the preceding question, consisting in flattening the axial and gingival walls and joining them at a definite line angle, the gingivo-axial line angle. The resistance form is afforded by the flat gingival wall. In the majority of cases, however, either the incisal step form or lingual step form is adopted.

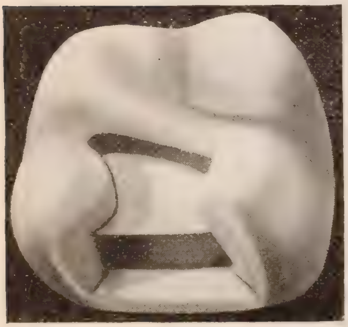


Fig. 109

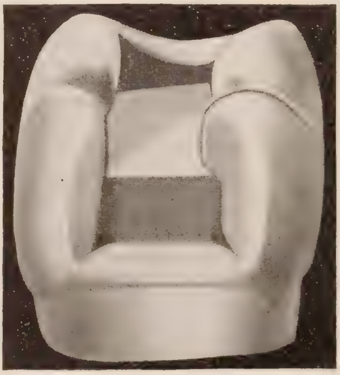


Fig. 110

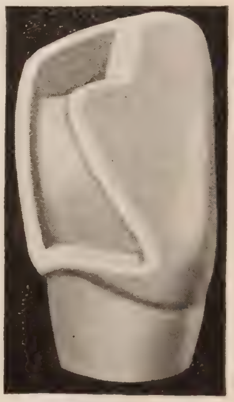


Fig. 111

Fig. 109—Occlusal view of the cavity shown in Fig. 112.
Fig. 110—A Proximo-occlusal cavity involving the mesial and distal fossæ on an upper molar.
Fig. 111—Incisal step form.

B *Incisal Step Form.* With a carborundum stone remove the cutting edge over into the middle lobe of the tooth, until the dentin is exposed. The labial and lingual margins of the cavity should first have been extended out in close proximity to the mesial or distal groove, (depending on whether the cavity is mesial of distal) and the angle cut away the same distance. Now, with the inverted cone bur, cut a groove across the cutting edge, in between the labial and lingual enamel plates, into the dentin, which has been exposed by the carborundum stone. Then remove a portion of the lingual enamel plate, leaving the labial plate untouched as far as possible, to avoid exposure of gold, and then deepen the groove further, continuing in this manner until the step is of sufficient size to admit of the necessary strength for resistance and to allow of a sufficient body of gold to withstand all strain. (*Figs. 111, 112, 113, 114, 115 and 116*).

C. *Lingual Step Form.* This form is used where the tooth is too thin labio-lingually to warrant the incisal step. With an inverted cone bur cut an auxiliary mortise form or step on the lingual surface of the tooth. The floor of this step is made flat and the lateral walls plane surfaces, joining the floor at definite line angles. Avoid exposing the pulp. (*Figs. 117, 118, and 119*).

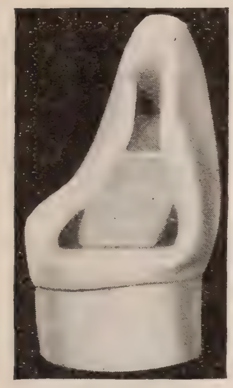


Fig. 112

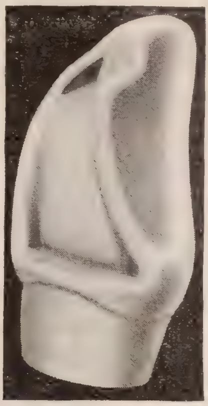


Fig. 113

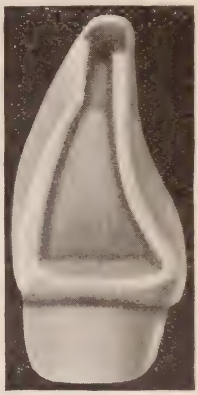


Fig. 114

Fig. 112—Proximo-incisal cavity on a central incisor. The compound mortise. The step has been cut largely at the expense of the lingual side, thus preserving the labial enamel plate.

Fig. 113—Proximo-incisal cavity on a central incisor. It has been necessary to involve both labial and lingual enamel plates owing to thinness of the tooth in the incisal region.

Fig. 114—Incisal step form on a central incisor. The auxiliary portion of the mortise has been carried entirely across the incisal surface.

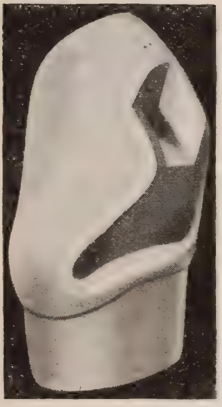


Fig. 115

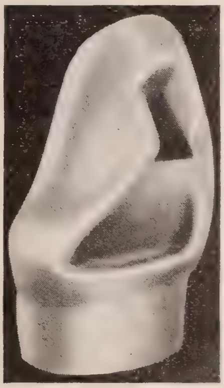


Fig. 116

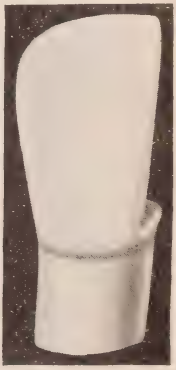


Fig. 117

Fig. 115—The incisal step form applied to a distal cavity on an upper cuspid. The labial enamel has been preserved.

Fig. 116—Another cavity similar to the one shown in Fig. 115.

Fig. 117—Labial view of a proximal cavity on a lateral incisor involving the angle.

242. Describe the *Technic for Resistance Form* in cavities in proximal surfaces of bicuspids and molars.

As a general rule, the cavity is extended onto the occlusal surface in the form of a step, it frequently being necessary to break down the marginal ridge. There are three methods of accomplishing this:

First Method. With a chisel and mallet cut a V-shaped opening through the marginal ridge, enlarging it until free access to the cavity is gained.

Second Method. With a bi-bevelled drill inserted into the occlusal pit or fossa, drill an opening through the dentin toward the proximal cavity until the area of decay is reached. Then cleave away the enamel of the marginal ridge as before, by means of the chisel, or remove it with a dentate fissure bur.

Third Method. Adjust the separator and attack the enamel from the buccal side with a chisel, gradually shifting more and more to the occlusal and continuing until the ridge is sufficiently removed.

After removal of the marginal ridge, extend the cavity in the form of a step, by means of the fissure and inverted cone burs, chisels, and hatchet excavators, the full length of the occlusal groove (bicuspids), or to include the entire central fossa (molars). With inverted cone burs, hoes and side-cutting instruments, flatten the gingival wall (the seat), make the buccal and lingual walls parallel with each other and joining the gingival wall at right angles. Make a definite line angle at the junction of the gingival and axial walls (gingivo-axial) and definite point angles (bucco-gingivo-axial and linguo-gingivo-axial) at the buccal and lingual terminations of this line. Flatten the top of the step, the pulpal wall, and cut that portion of the cavity, as well as the proximal part, to the box form with its line and point angles. (*Figs. 105, 106, 107, 108, 109 and 110*).

243. Define *Retention Form.*

The so shaping of a cavity that the filling may best be enabled to resist tipping or lifting stress. During the preparation of the resistance form this has frequently been largely provided for, though not always.

244. Describe the *Technic for Retention Form* in pit and fissure and gingival third cavities.

If the depth of the cavity is greater than its diameter, no extra retention form is needed, the filling being retained by its contact with the lateral walls of the cavity. The accomplishment of this condition, however, is not often possible, owing to the proximity of the pulp. In the majority of cases then, retention in this class of cavity is provided for by transforming the simple mortise form into the dovetail mortise form by undercutting one or more (usually two opposite), walls of the cavity. (*Figs. 92 and 97*). For this purpose, inverted cone burs and hoe and hatchet excavators are employed.

245. Describe the *Technic for Retention Form* in proximal cavities on incisors and cuspids not involving the angle.

The method of establishing the mortise form with its line and point angles has been described in the answer to question No. 240, although these cavities really require little resistance form. All that is now necessary to do is to still further accentuate the three point angles (labio-gingivo-axial, linguo-gingivo-axial and incisal). A one-half millimeter inverted cone bur is used on the gingival point angles, while the acute angle hatchet or hoe excavator is better adapted to the incisal angle. (*Figs. 92, 102 and 103*).

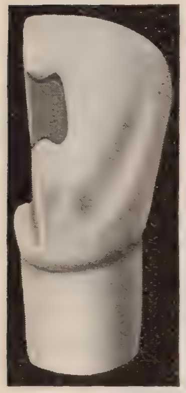


Fig. 118

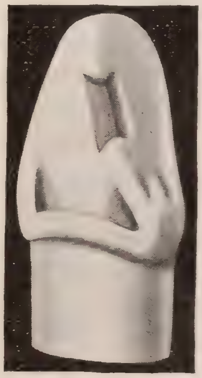


Fig. 119

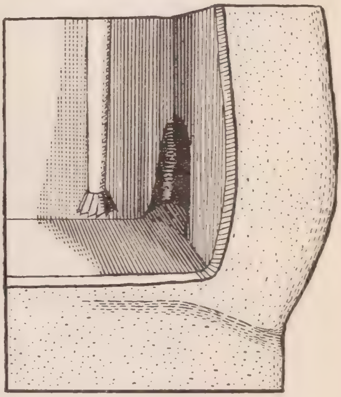


Fig. 119a

Fig. 118—Lingual aspect of the cavity shown in Fig. 117. A lingual step form has been adopted for retention.

Fig. 119—Another view of the cavity shown in Figs. 117 and 118. A modification of the compound mortise form.

Fig. 119a—Accentuating a gingival point angle in a molar with a number one inverted cone bur. The cutting has been done at the expense of the buccal and axial walls. The gingival wall has not been deepened.

246. Describe the *Technic for Retention Form* in proximal cavities on incisors and cuspids involving the angle.

The technic for the simpler cases is about the same as given in the preceding answer. In the *incisal step form* the entire step, which has been given a flat floor, is dovetailed on its labial and lingual walls and slightly deepened at its extremity by means of an inverted cone bur. (*Figs. 112, 113 and 114*). In the *lingual step form* the step is dovetailed throughout and its two point angles made more acute by means of the small inverted cone bur. (*Figs. 118 and 119*).

247. What important *Rule* should be followed in *Placing Retentions?*

Rule. The retention should be placed as near the point of stress as possible.

248. Describe the *Technic for Retention Form* in proximo-occlusal cavities on bicuspids and molars.

By means of the inverted cone bur, one-half to one millimeter, render more acute the four point angles and dovetail slightly the lateral walls of the auxiliary portion or step. (*Figs. 108, 109 and 110*).

249. Describe in detail the *Technic for Deepening the Point Angles* in retention and convenience form.

Use the chisel, hatchet and hoe, and the inverted cone bur, one-half to one millimeter in size. In deepening the *gingival point angles,* do so more at the expense of the axial, labial, buccal and lingual walls, than of the gingival wall. Place the blade of the instrument in the point angle, and after *slightly* deepening it at the expense of the gingival wall, cut along the line angle uniting the labial, buccal or lingual wall (as the case may be) with the axial wall, for a distance of about one-fourth the length of the line angle, thus forming a slight groove, which gradually disappears at its termination. (*Figs. 108, 110, 112*). For making the *incisal retention* form in proximal cavities in incisors and cuspids, use the acute angle hatchet, or hoe, placing its blade in the point angle and cutting at the expense of the labial and lingual walls, as well as deepening the angle toward the incisal. (*Fig. 103*).

250. Give *Six Methods of Retention* in proximo-incisal cavities.

First, Simple Incisal Retention. The weakest form, and indicated only where the stress of mastication is small and where there is abundance of dentin between the labial and lingual enamel plates.

Second, Incisal Step Form (Black). In this form the cutting is done at the expense of both labial and lingual enamel plates. (*Fig. 113*).

Third, Incisal Step Form (Johnson). In this form the labial enamel plate is left intact, the cutting being done largely at the expense of the lingual side. (*Figs. 111 and 112*).

Fourth, Lingual Step Form. Valuable in laterals and cuspids. (*Figs. 118 and 119*).

Fifth, Step Involving Entire Cutting Edge. Abraded teeth.

Sixth, Howe or Anchor Screw Post.

Seventh, Post in the Root Canal.

BEVELLING AND POLISHING THE ENAMEL MARGINS

251. Describe briefly the *Structure of Enamel.*

It is composed of numerous layers of hexagonal-shaped rods, the enamel rods, each rod being made up of prisms or globules placed end to end. The prisms are united very firmly together, while each individual rod is joined less firmly to its neighbor, with cementing substance. The enamel is the hardest tissue in the body and very resistant to cutting instruments. If, however, the underlying dentin be first removed, either by decay or with cutting instruments, the enamel rods may be readily chipped away or cleaved by chisels, in thin layers, in the direction of their length.

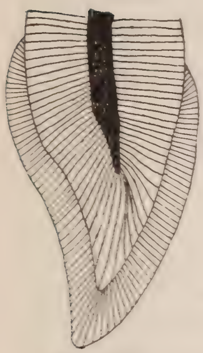


Fig. 120

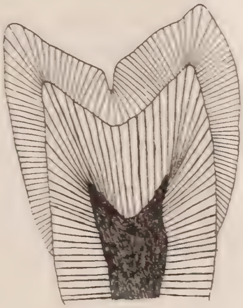


Fig. 121

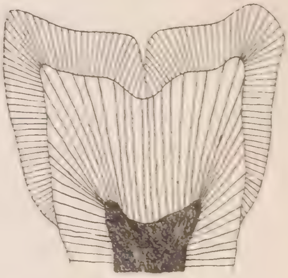


Fig. 122

Fig. 120—Diagrammatic drawing showing the radiation of the enamel rods on anterior teeth.

Fig. 121—Diagrammatic drawing showing radiation of the enamel rods on a bicuspid.

Fig. 122—Diagrammatic drawing showing radiation of enamel rods on molars.

On plane surfaces the enamel rods are placed perpendicularly to the dentin; on concave surfaces their outer ends radiate toward each other, while on convex surfaces they radiate away from each other. The direction of the rods on the various surfaces of centrals, laterals and cuspids is as follows, (*Fig. 120*):

A. On *incisal surfaces* the rods are perpendicular to the long axis of the tooth.

B. *At the angles* the rods on the incisal and axial surfaces approach each other; the more rounded the angle, the more the rods incline to the incisal.

C. On *axial surfaces*, they are more or less horizontal to the long axis of the tooth, radiating markedly to the gingival and to the incisal as these areas are approached.

D. At the *marginal ridges* the rods radiate toward each other.

The direction of the rods on bicuspids and molars (*Figs. 121 and 122*) is as follows:

A. At *pits and fissures* the outer ends approach each other, but radiate more and more to the perpendicular as we travel away from these locations.

B. At the *points of the cusps* the rods on occlusal and axial surfaces approach each other.

C. On *axial surfaces* they lie more or less horizontal to the long axis of the tooth, radiating to the occlusal and markedly to the gingival as these regions are approached.

D. At *marginal ridges* the rods radiate toward the occlusal on proximal surfaces; toward the ridge on occlusal surfaces.

The *bevel* of cavity margins should follow the general direction of the enamel rods in the different localities. A bevel ranging from two to seven centigrades is usually correct for filling work. In some instances this bevel should include the entire thickness of the enamel, while in others only the outer third receives the bevel. In every instance all unsupported rods should be removed, the marginal outline consisting of full length rods supported by dentin. In pit and fissure cavities very little bevel is necessary, the amount being increased with the increase in size of the cavity and the approach of its margins toward the point of the cusps. In proximal cavities a marked bevel is indicated at the gingival margin, while the amount on incisal margins will depend on their proximity to the angle and the convexity of the surface, the rods deviating more at the angles and on distal convex surfaces.

The *amount of bevel* will be largely regulated by the following conditions, viz.:

A Location of the cavity.
B Direction of the enamel rods.
C Strength of the occlusion.
D Friability of the enamel, and
E Edge strength of the filling material.

It was formerly thought that the variation in hardness of different specimens of enamel was due to a difference in the proportion of lime salts. It is now attributed to the amount of interlacing of the rods; the greater the amount of this condition being present, the harder and more resistant to cutting instruments the specimen. In the very hard varieties the minute structure somewhat simulates that of a pine knot.

For bevelling and polishing enamel margins, chisels (straight and bin-angle) of razor-like sharpness are indicated in the majority of cases; enamel hatchets, gingival margin trimmers, hoe excavators and gem points may also occasionally be used. Fine polishing strips and discs are also of value for polishing, but they should be carefully handled, to avoid rounding of the bevel.

Cavity outlines should be on regular curves or definite straight lines for esthetic reasons. When two margins join each other at an angle, the angle should be slightly rounded, being careful to leave the definite line angle in the underlying dentin. The bevel always should be definite, well defined and on straight lines from its deepest point to the surface, not curved.

TOILET OF THE CAVITY

The manipulations incident to performance of the toilet of the cavity may be outlined as follows:

First, remove all debris with the chip blower and warm air.

Second, inspect the cavity for any remaining decay, which should be removed, if found.

Third, swab the walls throughout with dry cotton or spunk, thus loosening any further debris; then use the air syringe again, thoroughly desiccating the walls.

Fourth, if sterilizing agents are, or have been used, swab the walls with alcohol, evaporate and dry again with cotton, and then freshen up the surfaces with a sterile bur before filling.

Fifth, if, after completion of the cavity preparation, a dressing is sealed in until the next sitting, freshen up the walls with a sterile bur again before insertion of the filling.

Sixth, all fillings should be placed against clean, freshly-cut walls.

"OUR PROFESSIONAL LINGO"

Under the above caption a writer objects, in the May issue of THE SUMMARY, to such words as "exodontist and orthodontist," being apparently under the impression that they are of mixed Latin and Greek origin. In this he is mistaken as the words are of purely Greek parentage; and from the Latin "ex-traho" we have "extraction" and "extractor." "Extradentist" would imply something quite different

And if objection is made to mixed deviation, and the objection is reasonable, still we have in our highly composite language quite a number of mongrel words, *e. g.,* "cablegram" and the etymological barbarism "electrocution!"

No doubt the real reason for such words as "exodontist" and "ophthalmologist," etc. is that they sound bigger than "tooth pullin' " and eye doctor or oculist.

W. BUZZELL.

EDITORIAL

THE NATIONAL DENTAL ASSOCIATION

The twenty-fourth annual session of the National Dental Association, held in Boston, Mass., August 23 to 27, 1920, was the largest attended of any meeting yet held by the organization. Six thousand, seven hundred registered, and it seemed as though every one came to get all the benefits possible from the sessions. The open meetings were crowded and many were turned away. The sectional meetings were all filled and many complained that they did not have more room. The exhibit hall was well filled all of the time, and everyone was of the same opinion that it was "a great meeting."

The program was elaborate and furnished by many of the leading dentists of America.

The chairman of the various sections expressed themselves as highly pleased with the valuable material presented at their sessions and members will enjoy a feast when the matter is published.

The sectional arrangement makes it impossible for one person to hear everything, but with so large an organization, no other arrangement is expedient.

While great interest was shown in all the sections, special interest was manifested in the section on Organization, Mouth Hygiene and Public Service. Here dentists showed that they were alive to the needs of advanced dentistry and evinced an eagerness to meet the demands that will be made on the future dentist.

Aside from the literary program and interesting clinics, the exhibits attracted great attention, especially that of Facial Surgery, presented by the United States Public Health Service from the Walter Reed General Hospital in Washington, D. C.

Another exhibit of special interest was that made by Dr. William Bebb, Chicago. It consisted of a collection of dental engravings, prints, paintings and drawings, probably the largest in existence, the result of a constant search over a period of twenty years.

A set of Vol. 1, No. 1, of many American dental journals.

A collection of supernumerary teeth.

An early dental operating case, with its pearl-handled instruments, of the period of about 1860.

The Dealers' Exhibit was one of the best ever given.

One of the outside attractions worthy of note was a visit to the Forsyth Dental Infirmary. Thomas A. Forsyth, the only living brother of the four who founded the institution, received the guests, assisted by Dr. Harold De Cross, the director, Dr. Anna V. Hughes, supervisor of the Forsyth-Tufts Training School for Dental Hygienists, and by members of the board of trustees.

There were meetings of several other organizations held during the week, Association of Military Dental Surgeons, Delta Sigma Delta Fraternity, Xi Psi Phi Fraternity, and Psi Omega Fraternity.

And on Wednesday evening, fourteen dental editors present at the meeting were guests of Secretary Dr. Otto U. King, at a dinner in the Copley Plaza Hotel. Here a Dental Editor's Club was formed and Dr. King elected chairman. Annual meetings will be held at the time and place of the National Dental Sessions.

The next meeting will be held in Milwaukee, in 1921.

New officers of the association are: H. E. Friesell, Pittsburgh, president; Thomas B. Hartzell, Minneapolis, president-elect; Otto U. King, Chicago, general secretary; A. R. Melendy, Knoxville, Tenn., treasurer.

The Boston meeting will be long remembered as one of the most enjoyable and profitable held by this association.

A Limited Vocabulary

In the course of a discussion between an American banker and a representative of a London bank on the subject of sterling exchange, foreign credits, and so forth, the matter of the proposed shipment of gold to the United States was brought up.

"If Britain were to attempt to pay off all her debts in gold at maturity," remarked the Englishman, "the English people would have to be called upon to turn over everything they possessed, consisting of gold, not excepting gold teeth, and the whole combined would be just a drop in the bucket."

"Yes," replied the American, "there's more truth than poetry in the old adage that 'Money talks'."

"It surely does talk," came from the Britisher, "but we never hear it say anything but 'Good-bye'."

SUGGESTIONS

CONDUCTED BY F. R. CHAPMAN, M.S., D.D.S., COLUMBUS, OHIO

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

Block Anesthesia Contraindicated

Block anesthesia is decidedly contraindicated in cases where epileptic tendencies are known to be present; in those suffering from heart lesions in advanced stages and in cases of arteriosclerosis and high blood pressure. If we find it necessary to use this method in these latter cases, however, the amount of vaso-constricting agent should be much reduced and the injection made very slowly and with the greatest care. Patients suffering from anemia or those in a condition of extremely lowered vitality are not good subjects.

The fact, on the contrary, that block anesthesia calls for no pre-operative preparation, and the absence of systemic after effects, either nephritic, cardiac or pulmonary, are distinct points in its favor. In addition, the resistance is not lowered and since our afferent sensory nerve fibers are anesthetized there is no traumatic surgical shock, and we have only psychic shock to consider.

Nerve blocking is, in most cases, contraindicated for operations on children. In those of advanced age where arterial or systemic complications are apt to be present, one should exercise extreme care in its use.

Having in mind these physical contraindications, we may repeat that the balance is greatly in favor of nerve blocking anesthesia. Practically every operation that can be performed under general anesthesia may be done under blocking, provided, of course, that it is possible thoroughly to anesthetize the area to be operated. The factors of bloodless field and patient's cooperation are of infinite value.

—F. J. Molt, Jour. Nat. Dental Association.

Be Watchful

The dentist should ascertain the cause of gum recession, or of the slightest congestion at gingival margins. Remedial treatment, systemic and local, should be applied at that time to prevent development of the different forms of dental periclasia. Nowhere is the truth of "one stitch in time" greater.

In diseases which affect tissue cells, it is the promptness or tardiness of the anemic factor, which renders periodontic treatment hopeless or successful.

The slightest erosion, which is ascertained to be free of any mechanical factor, indicates systemic vice which must be corrected under penalty of loss of health, or of reducing resistance to infection until only a mild amount of it will produce suppurative disease.

The combination of systemic measures based on nature's plan, and of special ones where needed, coupled with *office* and *home* oral prophylaxis, would eliminate dental periclasia, either atrophic or suppurative, if started in time.

Locally, improve circulation by massage, by relaxing masseter, temporal and buccinator muscles, and by vigorous chewing.

More office and home oral prophylaxis would lessen tonsillectomy.

—J. J. Sarrazin, Jour. Nat. Dental Association.

Root Canals

Screw an old hypodermic needle on the end of a chip syringe, and use for drying out root canals.—*E. P. Bateman, Katoomba, N.S.W., in Commonwealth Dental Review.*

A Method to Restore a Defective Edge on a Gold Inlay

We often have to discard a gold inlay casting because one of the edges is defective. This can easily be remedied by the following method:

Clean the inlay by heating, and plunge it in acid; wash, and place in tooth cavity. Make sure it is well home, and observe where the edge is defective. Now take a large pellet of S. S. White's pure gold and press it over the edge to be restored, allowing it to lap over into the cavity. Place inlay in tooth, press well home, tapping gently; then burnish pellet over edge of tooth, and remove both, being careful not to misplace foil pellet from inlay. Place a small piece of solder on the inside fringe of the pure gold and attach both together by heating with blow pipe. Place inlay and attach pellet back in cavity and again burnish to place. Cement in and polish. If this is done carefully, a perfect edge is the result.—*Howard R. Greenwell, D.M.D., Sidney, in Commonwealth Dental Review.*

Nitrate of Silver Antidote

The use of a solution of sodium chlorid after the application of silver nitrate to any of the mucous membranes will do away with the great discomfort to the patient resulting from the application of this drug.

—W. G., Oral Health.

Application of Rubber-Dam Clamp

If when applying the dam clamp, you fold two little pieces of muslin and lay them between the clamp and cheek, your patient will appreciate it.—*F. M. S., Oral Health.*

Vulcanite Dresser

Take a number of felt wheels, any size, or put on lathe and dress to any size you wish. Simply paint them with a good glue and roll them in emery any number you wish. Hang on peg over night. A few minutes' time will prepare a great number of these, and you will have dandy vulcanite dressers. Have used these with success for a number of years.—*C. V. Johnson, Dental Digest.*

Lemon in the Treatment of Stomatitis and Glossitis

For a long time lemon has been recognized and used successfully in different affections such as scorbutic stomatitis, rheumatism, gout, etc. The writer states that the most varied forms of stomatitis, attacks of glossitis of most diverse origin which remain unaffected by all recognized methods of treatment, may be favorably influenced by lemon juice given internally and used as a lotion, the amount being one lemon per day.

By this treatment the author has seen not only simple glossitis cured but also obstinate specific glossitis which has not responded to mercurial treatment. He has also seen exfoliatory glossitis, the resistance of which to therapeutics is well known and whose symptoms are so painful that alimentation is difficult, as well as common glossitis, cured by the lemon treatment.

The method of using lemon juice is as follows:

The juice from half a lemon is used for touching the affected areas many times a day. The other half is cut into slices which are sucked by the patient.

Generally speaking one might say that lemon juice gives excellent results in all cases of stomatitis and glossitis, herpes, apthous and ulcerative stomatitis, specific lesions of the cheeks and gums, etc.

I may add that I have used lemon juice in the treatment of pyorrhea with the greatest satisfaction to my patients and myself. One does not claim that this therapeutic agent cures the condition but it gives the patient great relief, which is a point for consideration.

—*M. Leven, in L'Odontologic.*

OHIO STATE SOCIETY

OFFICERS

President, C. W. MILLS, Chillicothe   President-Elect, H. M. SEMANS, Columbus
Vice President, C. H. SCHOTT, Cincinnati
Secretary, F. R. CHAPMAN, 305 Schultz Bldg., Columbus
Treasurer, A. O. ROSS, Columbus

Fifty-Fifth Annual Meeting, Columbus, Ohio, Nov. 30—Dec. 2, '20

The Fifty-Fifth Annual Session of the Ohio State Dental Society will convene in Memorial Hall, Columbus, on November 30th, continuing through December 1st and 2nd. Please note that the date is one week earlier than usual.

Splendid lectures and papers will be presented by eminent authorities on the subjects of Denture Construction, Partial Dentures, Interpretation of X-ray Films, War Oral Surgery and other subjects, including a series of fifteen-minute papers on practical and timely subjects. Dr. H. E. Friesell, president of the National Dental Association will be one of the contributors to the program.

Clinics will be held Wednesday forenoon and both forenoon and afternoon on Thursday; *making a full three day meeting.* Wednesday's clinic will be a "Manufacturers' Clinic," a new feature which will doubtless be of great value. Group, chair and table clinics by members and especially invited guests will fill the day's program on Thursday.

Make hotel reservations early and come prepared to enjoy a splendid program. Further details will appear in the November Summary.

F. R. Chapman, *Secretary*

The Component Societies of the Ohio State Dental Society

(This list of Officers is compiled from information furnished by the Secretaries of the various Components; where incorrect it is due to lack of information relative to elections. Secretaries are requested to keep the list correct by notifying the secretary of the State Society or the Editor of The Dental Summary of the result of elections.)

22 Butler County Dental Society, meets 3d Friday. each month.—Pres., P. A. Krucker, Hamilton, V. Pres., E. E. Meisterhaus; Sec.-Treas., F. T. Craven, Hamilton.

10 Central Ohio Dental Society, meets 1st Wed., Feb., May and Oct.—Pres., F. P. Leonard, Bucyrus; V. Prests., J. Pfanstiel and R. C. Bratten; Rec. Sec., L. T. McKinney; Cor. Sec., C. S. Delashmutt, Bucyrus; Treas., F. C. McCaughy.

27 Cincinnati Dental Society, meets 3d Friday. Pres., Wilson Foster, 22 W. 7th St.; V. Pres., Paul Cassidy; Rec. Sec., C. H. Stricker; Cor. Sec., D. A. Leahy, 904 Union Central Bldg.; Treas., J. D. Gordon

6 Cleveland Dental Society, meets 1st. Monday, Pres., W. S. Sykes, 3794 W. 25th St.; V.Pres. S. F. M. Hirsch; Rec. Sec'y, C. T. Story; Cor. Sec'y, F. M. Casto, 458 Rose Bldg.; Treas. J. L. Meikle.

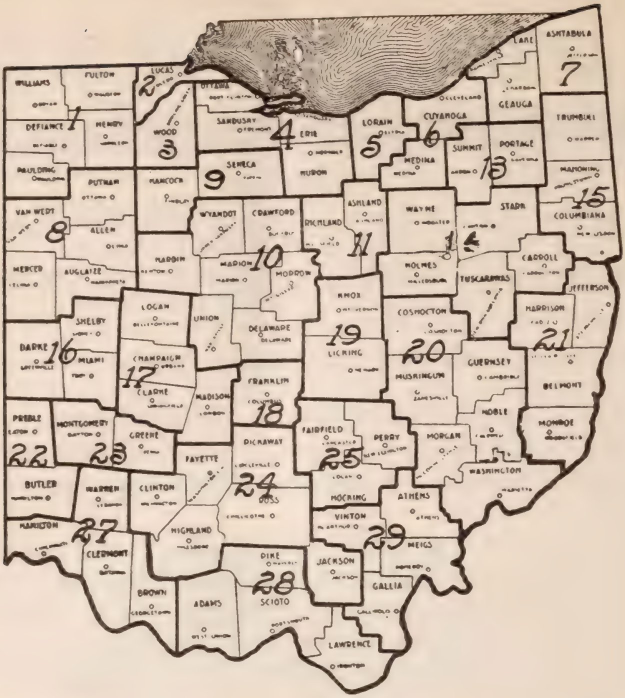
18 Columbus Dental Society, meets last Tuesday, Pres., D. P. Snyder; V. Pres., F. L. Gruber; Rec. Sec.. E. N. Hoopman; Cor. Sec., F. C. Starr; Treas., A. O. Ross.

15 Corydon Palmer Dental Society, meets 2d Thursday, April and Oct.—Pres., J. F. Steele, Lisbon; V. Presidents, T. J. Evans, J. H. Chessrown and G. L. Moore; Rec. Sec., J. T. Williamson; Cor. Sec., W. B. Challis, Lisbon; Treas., J. K. Nash.

21 Eastern Ohio Dental Society, meets 1st Thursday, May and October—Pres., C. S. Starkweather, Bellaire; First V. Pres, L. B. Peterson, Steubenville; Second V. Pres., George Sharp, Flushing; Cor. Sec., J. K. Hunter, Bridgeport; Rec. Sec., H. A. Smith, Steubenville; Treas., S. C. Hasbronck, Barnesville.

9 Hancock - Seneca Counties Dental Society, meets 2d Wednesday.—Pres., A. C. Cole, Fostoria. V. Pres., ———; Rec. Sec., E. V. Burns, Findlay; Cor. Sec., A. E. Mann, Findlay; Treas., V. H. Michener.

25 Hocking Valley Dental Society, meets 1st Monday.—Pres., J. J. Stukey; Vice Pres'ts., C.F.Acker; and W. M. Scott; Sec., R. H. Wetzel, Lancaster, Treas., J. A. Rockey.



5 **Lorain County Dental Society**, meets 1st Tuesday, Feb., Apr., Sep. and Nov. Pres., F. A. Newhall. Lorain; V. Pres., C. J. Love; Sec., J. G. Wherry, Elyria; Treas., J. E. Trombley.

17 **Mad River Valley Dental Society**, meets 2d Monday, bi-monthly.—Pres., E. Dibert, Springfield; Vice Presidents., A. E. Bible and H. Houser; Rec. Sec., H. H. Krapp; Cor. Sec. W. B. Seward; Treas., E. V. M. Thompson.

1 **Maumee Valley Dental Society**, meets 2d Tuesday, June and Oct.—Pres., N. A. Cunningham, Defiance; V. Pres., A. S. Blake; Rec. Sec., S. D. Potter; Cor. Sec., O. J. Wisman, Delta; Treas., J. A. Benner.

23 **Miami Valley Dental Society** meets last Monday. Pres. H. L. Oliver, 1020 Fidelity Bldg. Dayton. V.Pres. F. W. Cockerill; Rec. Sec'y. W. G. McBain; Cor. Sec'y. H. M. Brewer, 816 Harvard Blvd. Dayton; Treas. J. R. Arthur.

20 **The Muskingum Valley Dental Society** meets second Thursday. Jan., May and Sept.—Pres., P. F. Walker, Coshocton; V. Prests., A. W. Boyd and T. E. Axline; Sec., J. A. Honabarger, Warsaw; Treas., H. J. Boyd.

4 **North Central Ohio Dental Society**, meets 3d Wednesday, Jan. Apr., July and Oct.—Pres., A. G. Thatcher, Fremont; Pres. Elect., E. S. Braithwaite, Willard; Vice-Pres., H. S. Rogers, Sandusky; Rec. Sec., D. D. Smith; Cor. Sec. J. H. Billmeyer, Norwalk; Treas., L. F. Meyer.

7 **Northeastern Ohio Dental Society**, meets 2d Monday —Pres., H. O. Frederick, Ashtabula; V. Pres., O. T. Battles; Sec., R. J. Goggin, Ashtabula Harbor; Treas., R. J. Goggin.

8 **Northwestern Dental Society**, meets 4th Wed. Pres. G. K. Tolford, Lima; V.Pres. I. W. Basinger and J. M. Hurlburt; Rec. Sec'y. H. M. Crawford; Cor. Sec'y. J. W. Dimond, Lima; Treas. M. O. Van Stronder.

29 **Ohio Valley Dental Society**, meets 2d Wednesday, Apr and Oct —Pres. M. D. Hartinger, Pomeroy; V. Pres., R. B. Church; Sec., C. S. Shumaker, Pomeroy; Treas., J. B. Hodge, Middleport.

24 **Rehwinkel Dental Society**, meets 3d Thursday. Pres., A. M, Bush; V. Pres., O. A. Thompson; V. Pres., C. H. Martin; Sec,, F. D. Wollard, Washington, C.H.; Treas., C. V. Laam.

11 **Richland-Ashland Counties Dental Society**, Meets last Monday. Feb., June and Oct.—Pres., B. W. Livingston, Ashland; V. Pres., J. H. West-Rec. Sec., I. R. Suter; Cor. Sec., J. F. Clark, Mansfield; Treas., E. F. Cleland.

28 **Southern Ohio Dental Society**, meets, 3d Mon; day. May and Oct.—Pres.,W. H. Johnson, Waverly-V. Pres., A. S. Adams; Sec., C. E. Beatty, Portsmouth; Treas., E. O. Buchanan.

12 **Stark County Dental Society**, meets 3rd Wed. Pres. C. O. Carr, Canton; Pres.-Elect H. E. Deal; V. Prests. J. G. Foltz and O. B. Pfouts; Rec. Sec'y. M.M. Rubright; Cor. Sec'y. M. F. Gruber, Canton; Treas. M. F. Gruber.

13 **Summit County Dental Society**, meets 1st Friday. Pres., J. T. Connors, Akron; V. Pres.,———. Rec. Sec., H. G. Haas; Cor. Sec., F. S. Butler, 2d Nat. Bank Bldg., Akron; Treas., A. S. Butler.

2 **Toledo Dental Society**, meets 3d Friday. Pres., T. S. Shaw; V. Pres., H. W. Hisey; Sec., L. C. Jackson, 2205 Ashland Ave.. Treas., C. H. Cox.

30 **Tuscarawas County Dental Society** (a new society) meets 2d Tuesday. Pres. A. W. Davis, Dover; V. Pres., F. H. Waldron; Sec. and Treas., E. S. Wagner, Dover.

16 **Western Ohio Dental Society**, meets 1st Thursday, Feb., May and Oct.,—Pres. F. A. Clear, Greenville; V.Prests. H. A. Lightner, C. C. Fink and O. F. Sickman; Sec'y and Treas. F. A. McCullough, Troy.

3 **Wood County Dental Society**, meets 2d Wednesday.—Pres., B. D. Roe. Bowling Green; V. Pres., R. E. Milbourn; Sec., T. M. Lea, Bowling Green; Treas., E. R. Beatty.

19 **W. D. Miller Dental Society**, meets 2d Thursday. May and Oct.—Pres.,W. S. Deely. Mt.Vernon; V. Pres,, H. S. Barrick; Rec. Sec., L. E. Davis; Cor. Sec., E.V. Prior, Newark; Treas., W. B. Grossman.

SOCIETY·ANNOUNCEMENTS

Susquehanna Dental Association of Pennsylvania

The Fifty-seventh annual meeting of the Susquehanna Dental Association will be held at Hotel Sterling, Wilkes-Barre, Pennsylvania, October 26-27-28, 1920.

FULLER L. DAVENPORT, *Chairman*
520 Miners Bank Bldg.

Michigan State Board of Dental Examiners

The next meeting of the Michigan Dental Board for examinations will be held at the Dental College, Ann Arbor, Michigan, November 8 to 13, 1920. Those desiring further particulars may write to B. S. Sutherland, sec'y-treas., Owosso, Mich.

B. S. SUTHERLAND, *Sec'y-Treas., Owosso, Mich.*

Maumee Valley Dental Society

The Maumee Valley Dental Society will hold the next meeting at Defiance, Ohio, on Tuesday, October 12th, at 10:00 A.M., at which time they will celebrate the Fortieth Anniversary of the practice of Dentistry by Dr. S. A. D. Potterf.

Every member is requested to be present, and all friends of the doctor are invited to come and enjoy the day with us.

G. D. EDGAR, D.D.S., *Chairman.*

To Vulcanize On to Aluminum

In the matter of procuring a good joint or attachment between aluminium and vulcanite, it may be said that ordinary red or black rubber when vulcanized against aluminium is easily separated, but pink rubber, subjected to the same treatment, adheres very strongly. The union is not, however, sufficient to be trusted in artificial dentures, which are always subjected to a slight springing and bending when in use in the mouth; but the writer believes that if the surface of the aluminium which is to be covered with vulcanite is first painted over with a solution of pink rubber in chloroform, the attachment will be sufficiently strong to prevent any drawing away by reason of the shrinkage in vulcanizing. Of course, the usual mechanical attachment by staples is essential.—*Geo. B. Snow, Dental Digest.*

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NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

I hope that all readers of THE SUMMARY will bear with us in the matter of delayed publication. The delay is not the result of negligence on the part of anybody in any manner connected with either editorial or publication department; nor yet can it be charged to the printers, being entirely due to the inability to procure the necessary paper in time to make prompt mailing possible. Paper for our September issue was ordered in March, was delivered to the railway in June, and, after wiring, tracing, pounding and hounding, finally was received in Toledo, on September 10. It is our aim to mail the magazine promptly on the first of each month, and everything that can be done by us is done each month with the idea and purpose to bring about that result. That we do not always succeed is due to some circumstances over which we can have no control. Therefore, we feel that we may ask your patience a little longer, until normal conditions are in some degree restored.

Readers who have followed the course of the contributions from the pen of Dr. W. H. O. McGehee published in THE SUMMARY during the current year, need not be told that the writer is making a notable contribution to dental literature, and will be glad to know that the matter already printed, with large additions, is to appear in book form just as soon as it is possible to do the work. Dr. McGehee has devoted an immense amount of time to the writing of this book, and it will be found so helpful to the general practitioner as well as the student, that it should be in the library of every dentist. An announcement will appear in another issue. At this writing it is impossible to determine the price, but that too shall be done at the very earliest moment. Advance subscriptions will be filled in the order of their receipt.

Eight months in jail and fines of $750 each are the sentences imposed by a Boise, Idaho, court upon two dentists convicted of a conspiracy to ask and receive bribes for procuring dental licenses. A peculiar part of the sentences is that the money part must be paid by remaining in jail until it is worked out at the rate of $2.00 per day. One of the offenders formerly was a member of the state board.

Shelby County, Tenn., (Memphis), now has a circulating dental ambulance, in charge of Dr. C. N. Williams, for the better care of the teeth of children in schools.

Thieves are looting dental offices again, gold being the principle object sought. Wise dentists will carry low stocks, and also will see that scrap is not allowed to accumulate. Your depot always is ready to credit scrap gold as cash.

A dental students' society has been organized at Washington, D. C.

One result of the recent National meeting, at Boston, was the formation of the College of American Dentists, headquarters at Chicago. Dr. J. V. Conzett, Dubuque, president. The college will promote research work in dentistry, and will confer degrees upon such as make notable advances in the profession. The present Research Institute at Cleveland probably will be sold.

Dr. W. H. Henkle, of Cleveland, who, with his family, is touring the west via motor, writes that the only good roads on the entire route are in Ohio, while those of Illinois and Missouri are "seas of mud." Those further west, while not muddy, are very rough.

Bad teeth are said to be more prevalent on the Pacific slope than elsewhere in the United States, supposedly due to the absence of lime in drinking water. It is now proposed to pass all domestic water-supply through pulverized limestone.

In his annual report of the work of the New Jersey state hospital, Trenton, Dr. Henry A. Cotton, Medical Director, very seriously blames modern dentistry for many of the ills the hospital is called upon to treat. He states that "modern dentistry is a serious menace to the whole country," and calls attention to "the criminal practice of trying to save teeth that should be extracted." Which may all be very good; but who is to vouch for the infallibility of the good M.D.? What training in dentistry has he had that could fit him to sit in judgment?

"Organized dentistry is sixty-two years old," says the lay press in commenting upon the recent National meeting. Well, the Northern Ohio Association held its sixty-third annual meeting in June, last. Somebody must have slipped a cog.

Old King Alcohol was given another jolt at Boston, when a resolution favoring the addition of brandy and whiskey to the U. S. Pharmacopeia was voted down four to one.

The Central District Dental Society, Worcester, Mass., is trying to raise $50,000 to cover the installation of six additional school clinics in that city. The society is backed by school and health officials and by the teachers' association.

The Consolidated Dental Mfg. Co. is in serious financial difficulties. Receivers have been appointed, and bankruptcy petition filed.

Dr. L. L. Sheffield, Toledo, finished a class in modern denture making, at Atlanta, Ga., September 11, after a most helpful week to the seventeen or more members from all parts of the middle south. Reports from Atlanta dentists who took instructions from him speak of his work in terms of highest praise.

Dr. F. R. Henshaw, "Teddy" to his friends, was elected a vice-president of the National, at its Boston meeting. This means that in a year or two he will wield the gavel over a National Convention. Congratulations.

The Dutchess-County, N. Y., Fair Association offered a prize of $1.00 to each child attending the fair whose teeth were pronounced good by a board of examining dentists. This is good publicity. I recommend it to other localities.

Goes to Western Reserve Dental College

Dr. Lester I. Furnas, formerly of Indianapolis, has been tendered the chair of Prosthetic Dentistry in the College of Dentistry, Western Reserve University, Cleveland, Ohio. Dr. Furnas is looked upon as one of our leading teachers in this branch of dentistry and Reserve is to be congratulated on securing such a capable man for the position.

Delta Sigma Delta Fraternity at its meeting, in Boston, elected the following officers for the ensuing year: C. N. Johnson, Chicago, grand master; Chalmers J. Lyons, Ann Arbor, worthy master; R. H. D. Swing, Philadelphia, scribe; D. C. Bacon, Chicago, treasurer.

Psi Omega Fraternity, at Boston, elected officers as follows: Martin Dewey, grand master; Roscoe L. Voland, of Iowa City, junior grand master; Hugh MacMillan, Cincinnati, editor, and Donald Cameron, of Chicago, was re-elected secretary.

Association of Military Dental Surgeons elected the following officers: Col. Robert T. Oliver, of Washington, D. C., president; Lt-Com. Paul G. White, U. S. N., vice-president; Col. George H. Cassidy, of San Francisco, secretary-treasurer; Capt. W. D. Vail, editor and business manager of the association journal.

Southeastern Prosthetic Dental Association Organized

Atlanta, Ga., September 11.—Dr. L. L. Sheffield, of Toledo, Ohio, has just closed a most successful Post-Graduate course in advanced methods of artificial denture construction before a class composed of prominent dentists from Georgia, Florida, Alabama, and North and South Carolina.

Those in attendance were so impressed with the value of his instructions, that they thought it wise to organize for the sole purpose of stimulating an interest among its members, in the production of a more efficient class of artificial restorations.

The organization will endeavor to give at least one post-graduate course each year.

CHARTER MEMBERS

G. E. Harter, Toledo, Ohio; L. L. Sheffield, Toledo, Ohio; Chas. F. Crouch, Atlanta, Ga.; Chas. P. Hodge, Atlanta, Ga.; Miss Grace Taylor, Atlanta, Ga.; C. E. Roberts, Atlanta, Ga.; Fred J. White, Atlanta, Ga.; J. L. Haralson, Gainesville, Ga.; C. R. Brice, Gainesville, Ga.; D. B. O'Kelley, Miami, Fla.; J. R. Drummond, Greenville, S. C.; B. A. Thornton, Atlanta, Ga.; G. H. Myshrall, Atlanta, Ga.; W. H. Garrett, Atlanta, Ga.; R. F. McCormack, Atlanta, Ga.; G. O. Crouch, Atlanta, Ga.; W. D. Wells, Macon, Ga.; J. H. Shurley, Milledgeville, Ga.; B. L. Cloud, Greensboro, Ga.; W. J. Pierce, Columbus, Ga.; Chas. F. Davis, Hartford, Ala.; W. A. Presley, Rock Hill, N. C.

Laboratories represented: Bothwell-Bell Co., R. D. Webb Dental Mfg. Co., Southern Prosthetic Co., Sheffield Brothers.

Officers elected: Mr. G. E. Harter, Toledo, Ohio, honorary president; L. L. Sheffield, honorary vice-president; Chas. F. Crouch, president; Chas. P. Hodge, vice-president; C. E. Roberts, secretary-treasurer. Other committees to be announced later.

To the Dentist

To the dentist I am wending at the early hour of day, when the rising sun is lending glory to the stacks of hay; for a session elevating all arrangements have been made, and the painless dentist's waiting, with his crowbar and his spade. Oh, my ringbones long have smarted, and my spavins hurt my calves; for such things, in days departed, I used liniments and salves; but my teeth are at the bottom of such miseries as these, and the same old teeth, dod rot 'em, make existence seem a cheese. Once I had a temper cheerful, and my home was full of peace, and you heard no wailing tearful from my wife or aunt or niece; but for months I've been as nasty as a bear with festered dome, and I said things blanky-blasty when I had to write a poem. Oh, a shadow o'er me hovered, and it changed my wine to gall, and the doctor has discovered that my teeth produced it all. Of all uticas the pentest is the one that spoils our glee, so I'm going to the dentist, and the dentist waits for me. In his apron new and stainless he is waiting at his door, he is standing, tall and painless, and his smile is five by four; he is singing like a linnet, waiting there to cut his ice, and he'll charge a bone a minute, but the goods are worth the price.—*Walt Mason.*

National at Cleveland in '23.

Cleveland, Ohio, August 31.—Cleveland may entertain the 1923 convention of the National Dental Society, Dr. Joseph P. Henahan, 2035 E. 81st street, just returned from Boston where he attended the meeting, said today. Dr. Henahan was elected vice-president of the American Society of Exodontists and secretary of the oral surgery section of the association.

Scholarship Here for Australians

Philadelphia, Sept. 10.—A fund of between $30,000 and $40,000 to establish a scholarship at the University of Pennsylvania Dental School for graduates of some Australian university has been raised by Pennsylvania alumni living in Australia, it was announced today by J. H. Penniman, acting provost of the university. The scholarship is to be established as a memorial to Pennsylvania alumni who lost their lives in the World War.

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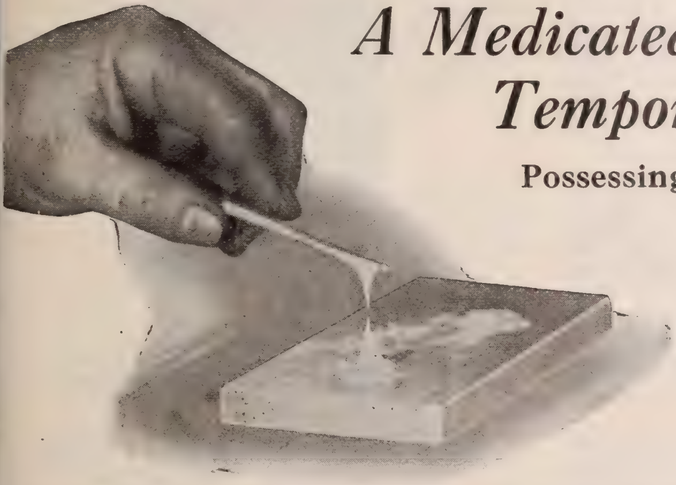

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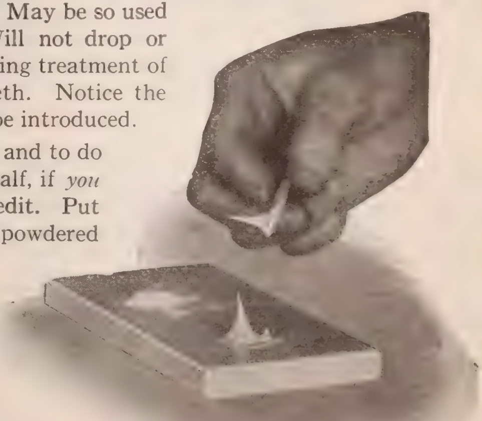

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Large package (3 oz. by vol.)	$2.50
Liquid or powder, separate	1.25
Spatula, style C	0.25

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Apply Dental Surgery to Cure Insanity Cases

St. Joseph, Mo., August 23.—Experiments in the application of dental surgery to treatment for insanity are being conducted in the No. 2 Missouri hospital for the insane, here, according to Dr. G. E. Ford and Dr. Walton E. Taylor. Several St. Joseph dentists and a throat specialist are conducting the research, according to the announcement.

No provision is made by the state for dental service in the state hospitals, the dentists say, with the result that the experimental work is at the expense of the men engaged in the work. The institution does not contain dental equipment, nor X-ray, nor has it ever had such equipment since it was established in 1874.

Doctor Ford, said, 724 patients have been treated. Sufficient improvement has been noted in a number of patients to convince the researchers that with state co-operation they could effect a radical improvement in the condition of many of the patients.

Indiana—Green County Picnic

Bloomfield, Ind., August 17.—The Green County Dental Association entertained the dentists of Sullivan and Vigo counties at an all-day picnic, last Thursday, at Dr. H. R. Isenhower's farm on White river. All the dentists of this county were present and some visiting ones.

Dr. Bull, of Linton, who is a chef of unexcelled ability, prepared the sumptuous chicken dinner.

The features of entertainment consisted of trap shooting, boating, swimming, pitching horse shoes and like sports. Dr. Will Welch, of Linton, was voted the star prize winner, being awarded the booby in every contest.

The outing was thoroughly enjoyed by the professional men and they probably would have held an evening session but for the downpour of rain which caused them to disband. As it was, Dr. Todd, of Linton, was enjoying himself to such an extent that he was the last to leave and in attempting to start his car found it to be an impossibility. The others having gone on before, he was compelled to spend the night on the river bank alone.

Ontario—Dominion Council

Ottawa, August 18.—Officers elected at the annual conference of the Dominion Dental Council which closed its session last night were: H. F. Whittaker, Edmonton, president; H. R. Abbott, London, Ont., first vice-president; J. S. Bagnall, Charlottetown, P.E.I., second vice-president; W. D. Cowan, M.P., Regina, secretary-treasurer. The Canadian Dental Association, a distinct body, is now in annual session here.

Civilized Food Decays Teeth

Boston, August 24.—The Eskimo in his natural state, living directly off the land and sea, is free from dental decay, but when he

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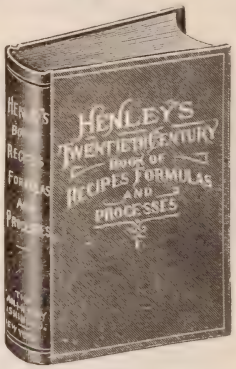

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every one who seeks PRACTICAL, ACCURATE KNOWLEDGE and guidance in his everyday work MUST HAVE at his command.

It is a money-maker and a money-saver; it appeals to the young as well as to the old. Great business enterprises owe their success to the manufacture or sale of simple inventions or compounds, usually the results of an experiment at home. One woman writes; "I am supporting myself and two small children from the sale of toilet articles I put up by following directions in your book."

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THE DENTAL SUMMARY
TOLEDO, OHIO
Drawer 906

eats the foods of civilization has trouble with his teeth, Vilhjafmur Stefansson, the Arctic explorer, has found. In a letter to Dr. Percy R. Howe of this city, to which the latter referred in an address today before the National Dental Association, the explorer said he had noted particularly that the Eskimo showed extensive tooth decay when he was given modern foods.

Canadian Dental Research

Niagara Falls, Ont., August 23.—For the purpose of carrying on dental research throughout Canada and as a permanent memorial to dentistry's part in the war, the Canadian Dental Research Foundation was organized and incorporated officially at the meeting held in Ottawa yesterday. It was decided to establish a fund of $100,000 of which $50,000 would be subscribed by dentists and the remainder by public spirited citizens.

Ancient Dentistry

Interesting specimen of Etruscan dentistry is now in the civic museum at Corneto of the Necropolis of Tarquinii and consists of three teeth, or, more properly, four abutment attachments and three supplies, the attachments being gold rings and the teeth supplied being the central incisors and bicuspids. The two central incisors are made from a single ox tooth grooved down to give it the appearance of two upper central incisors.

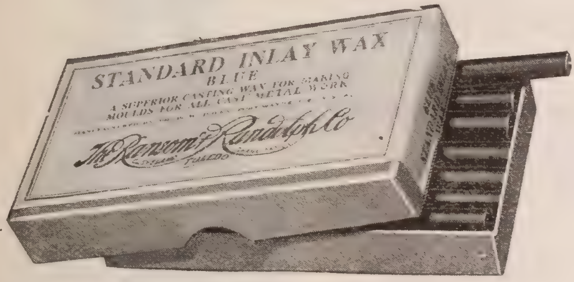
Vienna Physicians Destitute

Vienna is today battling for its very existence. The gay crowds of well dressed people and elegant equipages which once thronged the magnificent Ring and the lovely Prater have long since vanished. The fine trees of the Wiener Wald have become victims of the woodchopper.

A recent dispatch to the Musical Courier says: "Vienna is the saddest city in the world. If one is soft-hearted, it is difficult to repress the tears as one wanders through its once brilliant streets. While one stops to greet a friend, three beggars or more appeal to one's charity. And such beggars; ragged and haggard, emaciated, yellow creatures that once knew joy. As one rides through the streets poor mothers with thin, paper-skinned babies look at one from the curb. Hands stretch out from everywhere."

A prominent New York banker, recently returned, says: "All that class (professional people) are left with absolutely nothing. All the time I was in Vienna I couldn't help feeling that I was living in a morgue. Beautiful streets, a beautiful opera house and the city beautifully kept—but nothing doing."

Viennese dentists are in desperate straits. They must continue to do their part in relieving the many ills of an undernourished population, but they cannot feed their children with the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BLUE
A SUPERIOR CASTING WAX FOR MAKING MOULDS FOR ALL CAST METAL WORK
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Standard Inlay Wax

Black—Medium Hard
Blue—Hard
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ALL colors of **Standard Inlay Wax** are tough and rigid when cold, softening readily in flame or hot water. Do not flake nor scale when heated, nor readily chip or break when cold. Plastic and tough when hot; can be spread and built up as needed. Cut easily, leaving a smooth, glossy surface. Carve readily and smoothly to sharpest lines. All colors burn out clean, forming very volatile gases that disappear without residue under moderate heat.

Standard Inlay Wax, Green, is extra hard, being positively rigid at mouth temperature.

Standard Inlay Wax, Blue, has been produced in response to a growing demand, and is now offered as possessing all of the desirable qualities that have made our older waxes so popular. **Blue** wax is a trifle harder than the **Black**, not so hard as the **Green**. Color is strong, showing sharp contrast with tooth structure, easily seen in the mouth.

Per box, any color, Black (medium hard), Blue (hard), Green (extra hard)................................$0.50

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scanty government ration, even when supplemented by their pitifully meager incomes.

The American Relief Committee for Sufferers in Austria, 261 Madison avenue, New York, of which Hon. Frederic Courtland Penfield, late American Ambassador to Austria-Hungary is honorary chairman, has created a special fund for the relief of destitute Viennese physicians and dentists.

Contributions may be made to Alvin W. Krech, president, Equitable Trust Company, 37 Wall street, New York City, treasurer of the committee.

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Fifty ounces	32.50
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An Acknowledgment

Vienna, August 28, 1920.

American Relief Committee for
Sufferers in Austria:

I acknowledge herewith receipt of Draft No. 41571 for 477,940 Kronen, and add my heartfelt thanks to the charitable contributors, to all of whom I would write if I knew their respective addresses. Tell them, please, how much we appreciate their welcome endeavors to assist us in our plight, which seems to become more and more distressing. We must repeat it again and again, that the crippled state, "new Austria," can't live by itself alone, having been deprived of all its former resources—not being able to produce more than the fourth part of food wanted by its six millions of inhabitants, and having neither coal nor the necessary raw materials to work into industrial articles, to buy food with, the crown having become nearly worthless.

If this hopeless condition of new Austria is not grasped to its full extent by the outer world very soon, the twentieth century of progress and civilization will witness the spectacle, unheard of in the history of mankind, of a people doomed to die of hunger, although it is intelligent, skillful and willing to work.

With repeated warm thanks to the donors and to you, I remain

Gratefully yours,
PROF. ADOLF LORENZ.

DEATHS

At New York, August 17, of Reynaud's disease, Dr. R. S. Carman, aged 49. But five other persons have died of this disease in the history of the U. S. It is characterized by progressive closing of the capillaries and destruction of circulation in the extremities. Both Dr. Carman's legs had been amputated in the effort to check the disease.

At Philadelphia, August 10, Dr. William Reeves Conklin, an honor graduate of U. of P., aged 25.

At Philadelphia, August 20, Dr. Lewis S. Rubinsohn, aged 60.

At Belfast, Me., August 24, Dr. Herman G. Hichborn, of Cambridge, Mass., aged 59.

At Philadelphia, August 20, Dr. Robert H. Techlenburg, aged 55.

At Chicago, August 28, Dr. Harold G. Powell, aged 43.

At Scarborough Beach, Me., September 7, Dr. George Franklin Eames, of Boston, aged 67. Dr. Eames had published several books on dentistry, and was a frequent contributor to professional magazines.

At Condon, Oregon, August 30, Dr. Vernor A. Lyon, assistant manager Patterson Dental Supply Co., Spokane.

At Philadelphia, Pa., August 29, Dr. Ira W. Stoughton, aged 67.

At Marysville, Calif., August 20, Dr. A. J. Williams, formerly of Springfield, Ills.,

At Evansville, Ind., August 30, Dr. W. H. Stonecipher, formerly of Petersburg, Ind.

At Norfolk, Va., August 26, Dr. John F. Powers, aged 38.

At New York, September 9, Dr. Albert E. Koonz, aged 46.

At Pittsburg, August 28, Dr. G. L. Simpson of Coraopolis Heights.

Dr. Simpson was one of the founders of the Pittsburgh Dental College, now the School of Dentistry at the University of Pittsburgh, and for six years was dean. For some time he occupied the chair of dental histology, pathology, therapeutics and electricity. He was a member of the Duquesne club and took a prominent part in Boy Scout work.

He leaves, besides his widow, three sons, George L., Jr., William McElroy and Thomas R., a daughter, Eleanor, four brothers and two sisters.

Dr. Alfred Evans, of 1835 Wayne avenue, died Saturday afternoon, September 18, at Robinwood hospital, Toledo, as the result of injuries received Wednesday afternoon, when his shotgun was accidentally discharged while he was hunting near Swanton.

Dr. Evans' death was unexpected as his injuries were not regarded as dangerous, until shortly before his death when gangrene set

THE HALVERSON
NEW TYPE STERILIZER

Heating Element and bevel faced three-heat switch are securely fastened to a metal reinforced bed plate with

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in in the muscles of his arm, where the shot had entered. He is survived by his wife and a four months' old daughter.

Dr. Evans came to Toledo two years ago and has practiced with Dr. S. S. Riner, at 343 Detroit avenue. He was well known in dental circles in Toledo.

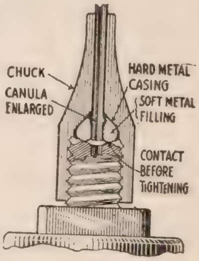
A Corporation Cannot Practice Dentistry

Harrisburg, July 16.—Attorney General William I. Schaffer has officially advised Governor Sproul not to issue letters patent or a charter to a corporation to practice dentistry. He holds the right to practice is regulated by act

When You Buy and Use

The Schimmel R&R Co. Dental Needles

You are Insured Against Needle Trouble



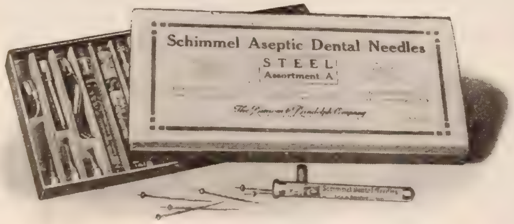
1. Leaking is prevented without the use of washers of any kind. (See illustration.)

2. Breaking is reduced to the minimum, since, in use, the needle is reinforced by the entire length of the chuck. Much superior to any soldered needle. (See illustration.)

3. The solution cannot come into contact with threads of questionable cleanliness. (See illustration.)

4. Any length of point may be obtained, from ⅛ to 1⅝-inches, by the use of different Chucks.

5. Replacements are less costly than with other high-grade needles.


Schimmel Aseptic Dental Needles
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Assortment A
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Assortment "A," in nickel and steel, contains:

2 tubes, 6 ea., ¾-in. 4 tubes, 6 ea., ⅞-in. 4 tubes, 6 ea., 1 -in. 2 tubes, 6 ea., 1⅝-in.	1 each Chucks B, C, G 1 each Connections D, E, F	Price, Nickel **$10.00** Price, Steel **$9.00**

In ordering say "Assortment A," and specify *nickel* or *steel*.

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of Assembly and is in the nature of a license from the State.

"It cannot be sold, assigned or inherited, but must be earned by hard study and good conduct," says he. "It is not a lawful business except for persons who have complied with all the conditions required by statute. The practice of dentistry is not a business open to all, but a personal right, limited to persons of good moral character with special qualifications ascertained and certified after a long course of study and a thorough examination by the Board of Dental Examiners. * * * *

"It is impossible for a corporation to be examined as to its fitness to practice dentistry. It cannot secure a license so to practice. As these conditions cannot be performed by a corporation it follows that the practice of dentistry by it is an unlawful business for a corporation to engage in."

As to a charter of this character reported issued some years ago, the Attorney General holds the act of 1915 would forbid it now.

Palestine's first medical journal, "*Harefooah,*" (Medicine) has just made its appearance, published by the Jewish Medical Association of Palestine. The journal is a quarterly and its first issue is dedicated to the memory of the Jewish physicians and nurses, who "lay down their lives in the years of upheaval in the Holy Land."

The objects of the medical association, as outlined in the quarterly are to strengthen and coordinate the medical forces of the country and to collaborate with doctors outside Palestine; to give the medical work a national as well as a humane value; to prepare a native soil for Jewish scientists; and to help in the creation of the Hebrew university.

Medical work in Palestine has advanced rapidly during the past two years, stimulated by the American physicians and nurses with the American Zionist Medical Unit, who have taught the native members of the profession, all the latest ideas in medical work and sanitation. Clinics are held by the American doctors, to demonstrate to the Palestinian doctors, the most modern methods, and lectures are given at regular intervals.

The hospitals and clinics established by the American Zionist Medical Unit in Palestine, are planned as the beginnings of the medical college of the Hebrew university at Jerusalem, which Prof. Patrick Geddes, noted town planner of the university of Edinburgh, is designing.

A Patient's Idea of Dentistry

The following letter explains itself. In spite of all the dental education that has been given to the dear public, there certainly would seem to be room for more.

Dear Doctor:

About a month ago you fixed up a crown for me which lasted very nicely until yesterday. Now, I cannot come in this week, so won't you please fix another crown, at same price, and my boy, who goes to high school, will call for it tomorrow after school. I have company coming Friday from Chicago. It is the tooth next to the two front teeth, just an ordinary-size crown, with a medium-length pin, not very short, not so very long. I shall appreciate this very much. The boy will pay you.

Sincerely,
Mrs. A. B. L.

"And there you are."

U. S. Public Health Service

DENTAL EXAMINERS APPOINTED BY THE BUREAU OF WAR RISK INSURANCE

Cheboygan county, Mich., Dr. A. E. Sangster, Cheboygan; Rome, N. Y., Dr. Harold E. Dorn; Red Lake county, Minn., Dr. A. E. Lucian, Red Lake Falls; Yonkers, N. Y., Dr. Victor A. Martin; Alta Vista, Ia., Dr. L. A. Kieren; Greene county, Ohio, Dr. E. J. Reynolds, Xenia; Mercer county, Ill., Dr. W. W. Moorehead, Aledo; Hibbing District, Minn., Dr. Wilbur Wring, Hibbing; Delaware county, N. J., Dr. Leroy D. Neish, Walton; Wood county, Ohio, Dr. T. M. Lea, Bowling Green; Litchfield district, Minn., Dr. A. C. Nelson, Litchfield; Davies county, Ky., Dr. O. B. Heavrin, Owensboro; Fulton county, Ind., Dr. Perry Heath, Rochester.

Dental Society Meetings—1920

STATE SOCIETIES

November—18, District of Columbia, George Washington University, Washington, D. C.; Arizona, Phoenix.

December—2-3-4, Ohio, Columbus; 10, Delaware, Wilmington.

Dates to be announced—Arkansas, Little Rock; California State; Louisiana, New Orleans; Montana, Great Falls; Oregon, Portland; Washington, Tacoma.

Classified Advertisements under this heading, $2.00 each for 60 words or less; additional space, 2 cents per word, single insertion; three insertions or more, special rate on application.

FOR SALE—Dental practice with complete modern outfit, in Michigan city of 60,000. Established fourteen years. Good clientele. A bargain for a good man. Owner expects to specialize in a larger city. Address, P1010, The Dental Summary.

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MATERIALLY AIDS
Local Treatment in
PYORRHEA
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Memorial Hall
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November 30, December 1, 2, 1920

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Denture Construction
Partial Dentures
X-Ray Interpretation
War Oral Surgery

Fifteen-minute Papers on Timely Subjects

Many able men will be there, including
DR. H. E. FRIESELL, President National Association

CLINICS—Three Half-day Periods

SOMETHING NEW—Manufacturers' Clinic Wednesday

Make Hotel Reservations NOW—It'll be chilly sleeping in the parks!

O. S. D. S.

DR. WILLIAM G. EBERSOLE

—See page 1001

REGULAR CONTRIBUTIONS

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL November 1920 No. 11

THE CAST ALUMINUM BASE

BY DAYTON DUNBAR CAMPBELL, D.D.S., KANSAS CITY, MO.

SPECIAL LECTURER DENTAL PROSTHESIS, KANSAS CITY WESTERN DENTAL COLLEGE;
FOUNDER AND PRESIDENT OF CAMPBELL SCHOOL OF PROSTHETIC TECHNIC

WITH THE EXCEPTION of platinum and gold the best base upon which the prosthetist may mount artificial teeth is *aluminum*. Aluminum is a good conductor of heat and cold, and accordingly permits the tissues of the mouth to receive the stimuli which vary with the temperature at which different viands are partaken, and which in many instances give to choice dishes their characteristic and more palatable flavor. Aluminum does not permit the tissues to deteriorate through remaining abnormally heated as is often the case when the area is covered with a vulcanite base. Such abnormal condition as results from wearing vulcanite dentures is akin to the abnormal and discomforting condition which the hunter experiences in the case of his feet after he has worn rubber boots for a number of hours. From childhood we have been admonished regarding the evil effects of wearing arctics or overshoes or rubber boots, except when greater evils could thus be avoided, but the lesson seems to be one that is difficult to profit by, even though the tissues of the mouth, because of rubber bases are subjected to dangers more menacing to health than we were ever wont to dream of in childhood. To sum up, vulcanite may keep the mouth in a super-heated chronic pathological condition, which may be avoided through the use of an aluminum base. One has but to note the normal pink physiological condition of the mouth wearing an aluminum base, in order to be convinced that the superiority of aluminum is no imaginary superiority.

Many practitioners are obsessed with the idea that the aluminum base can not be as well adapted as the vulcanite. This obsession not infrequently results from experiences with laboratories which do not swedge their aluminum bases down to adaptation upon the original cast, after casting them. Since the coefficient of expansion and contraction is as great as it is in casting aluminum, it can be regarded as scarcely anything but a species of malpractice to attempt to secure adaptation without swedging in order to compensate for the shrinkage that occurs during the casting process. If it were possible to alloy aluminum so that this shrinkage would not take place and thus would eliminate the necessity of swedging, this new alloy might serve some purposes but it would not serve the prosthetist. He could not use it because alloyed aluminum in the fluids of the mouth becomes an element of a galvanic battery, in which the presence of the alloy together with the aluminum results in a disintegration of the metal, similar to that which occurs in the wet cells sometimes used by telegraph companies, the kind in which the zinc and copper elements are immersed in a solution of blue vitriol or copper sulphate.

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*This is the tenth of a series of twelve articles being written by Dr. Campbell, especially for the 1920 volume THE DENTAL SUMMARY.

*EDITOR'S NOTE: Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

On account of this tendency of alloyed or impure aluminum to disintegrate under the influence of electrolytic action, many dentists refuse to have anything to do with the aluminum base, because, they say, that after a few years it becomes full of small holes. This objection usually is raised by the older men in the profession and their objections were once well based. Fifteen or twenty years ago it was manifestly impossible to secure aluminum pure enough for the prosthetist's purpose. The manufacturers had not succeeded in eliminating the two or three per cent. of iron and silicon. At that time also, practitioners were accustomed to swedge a twenty-six gauge aluminum blank between a die and counter-die. In the process, no doubt, a small particle of foreign metal became imbedded in the finished base, and after a short while the electrolytic action mentioned above resulted in the destruction of the denture.

Not a few of those who have regarded the aluminum base with favor, have complained that the vulcanite pulls away from its moorings on the base. It is patent to all who have been engaged with these materials that vulcanite and aluminum are not compatible. However, we do know that aluminum and tin are compatible, and further that if we do not soap the tinfoil when we are closing the flask during the packing process, it is almost impossible to separate the rubber from it. Accordingly, we were accustomed to put a layer of tinfoil between the aluminum base and the rubber. At the present time we use a thin layer of weighted rubber (which is weighted with shavings or filings of tin) where we formerly employed the tinfoil. However, the complaint is as valid against gold bases as it is in the case of aluminum, and there is never any occasion for it, if a sufficient number of grids or ties or retainers are provided.

TO CAST AN ALUMINUM BASE

In pouring the impression for an aluminum case we follow the technic as described in the May issue of THE DENTAL SUMMARY. The cast is made much thicker than when vulcanite dentures are contemplated, in fact the thickness should equal the breadth; these dimensions represent the strongest form of solid known to physics, and accordingly is desired to withstand the stress that it must undergo in swedging. It is unnecessary to pour a metal die, since Spence's plaster satisfies every ordinary requirement.

After the cast is trimmed, the relief over the hard areas is supplied through the use of physicians' adhesive tape cut to shape and size as required by the individual case; this adhesive is attached to the cast, and the edges, as well as any looseness in the texture of the tape, are sealed with a minumum amount of wax. In some cases it seems that "minimum" has been interpreted in such liberal fashion as to allow the use of an amount easily sufficient to attach a half dozen; the tape is not intended to provide an air chamber, but only to afford a relief.

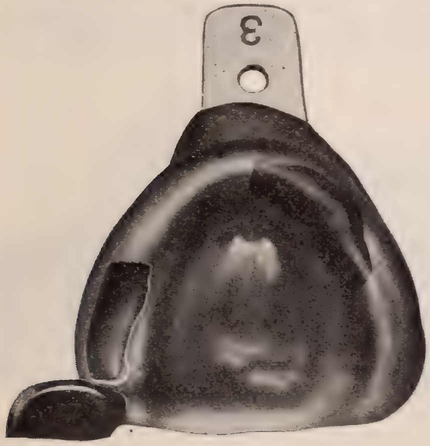

Fig. 1

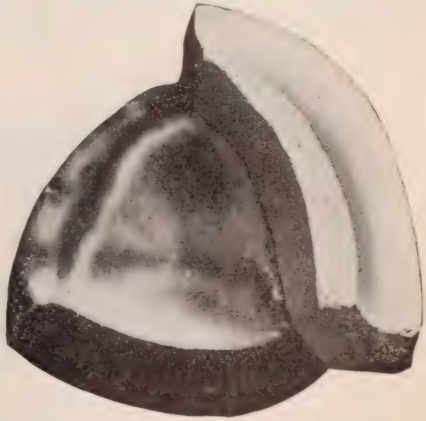

Fig. 2

Fig. 1—Modeling compound impression (with cores of S. S. White's Black Impression Tray Compound.)
Fig. 2—First section of plaster impression.

The Spence cast is now treated with powdered soapstone; where this is not easily obtainable a cheap grade of talcum powder serves very acceptably. This is sprinkled upon the cast and rubbed in until it presents a glazed and polished surface, care being taken to avoid leaving any surplus. The surplus sometimes accumulates in spots which obviously prevents the modeling compound impression from being an exact negative reproduction of the cast.

THE IMPRESSION OF THE SPENCE CAST IS MADE WITH MODELING COMPOUND

The original impression of the mouth is of course the most important factor in assuring perfect adaptation of the finished base. The factor next in importance, and the one which the instructor finds most difficult to secure at the hands of the student is the impression of the cast. For this purpose, modeling compound that has been used in the mouth, if free from particles of plaster, is really more acceptable than new compound. It has lost some of its "life," is not so sticky at the same temperature, and naturally is more economical. An oversize Britannia metal tray is filled with this compound, which previously has been warmed to proper consistency and kneaded as mother kneads her last bit of biscuit dough, kneading the wrinkles under so that the surface which comes in contact with the cast while taking the impression will be perfectly smooth. After placing in position on the tray and allowed to cool until it would be too cold to use in the mouth, the surface is heated over the flame, sprinkled with the powdered soapstone, which after being smoothed lightly with the fingers is then blown away; it is then pushed down upon the cast which during the operation rests securely upon the bench. The compound is pressed against the anterior portion of the cast first and then gradually settled to position towards the heel. When it is fully in place, the cast and tray are held firmly between the fingers and thumb of one hand, while the other is employed to press the excess compound back over the tray in order to facilitate the removal of the cast when the impression is cold. The impression while on the cast is placed in cold water; when chilled thoroughly they may be separated. Often this act of separating is attended with no little difficulty; care should be exercised to avoid breaking or marring unduly either cast or impression. The impression is now scrubbed in cold water, using for this purpose a vegetable brush and ivory soap. This operation is not so much for the purpose of removing the soapstone as for polishing the impression.

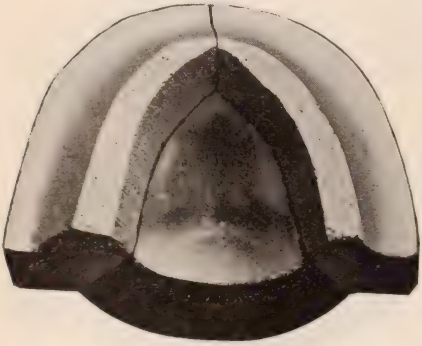

Fig. 3

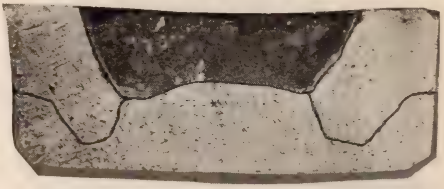

Fig. 4

Fig. 3—Two sections of plaster impression.
Fig. 4—Showing top section of plaster impression.

CORES ARE MADE FOR UNDER-CUTS

In cases of under-cuts, S. S. White's Impression Tray Compound is employed for making cores, which greatly enhance accuracy and facilitate removal of the impression. The impression tray compound has a higher melting point than Kerr's, and accordingly will not be affected by the heat of the larger mass of Kerr's when surrounded by it. The region of the under-cut is thoroughly oiled; the compound is softened and shaped into a cone, the base of which is chilled. The apex of the cone is now forced into the under-cut and up to the crest of the ridge as well as slightly over the border of the cast. The excess is trimmed away until about half of the protecting border of the cast is exposed, and the core beveled to the ridge. As many of these cores may be made as is necessary to eliminate all under-cuts. The surface of these cores should be oiled before the impression is taken. When the impression has been removed, the cores may be taken out of the under-cuts and set into their proper places in it. *Fig. 1* shows the impression provided with cores.

PLASTER MAY BE USED FOR IMPRESSION OF CAST

For those who feel that in their hands the use of plaster will yield more satisfactory results, we present the *Figs. 2 to 6*, which are self-explanatory. The case to be duplicated is painted with silex and the impression made of cast plaster in different sections; each of these is trimmed to form, and the adjacent surface painted with silex before the next section is poured. When the last one is poured, the sections are assembled and the resulting impression poured as in the use of compound. Cores may be made either of compound or plaster.

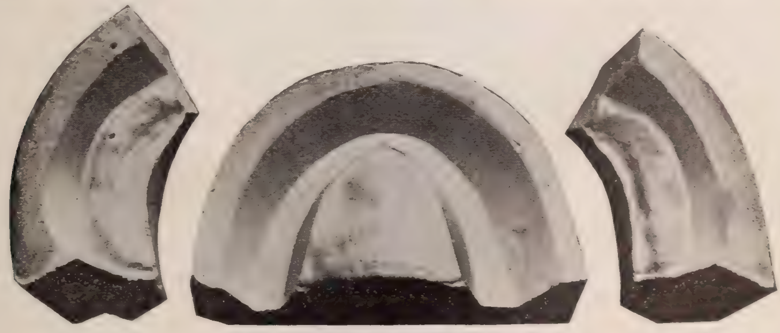

Fig. 5—Sections of plaster impression removed from cast.

INVESTMENT MATERIAL FOR POURING DUPLICATE CAST

The impression is poured with a good grade of crown and bridge investment. If the reader is successful enough in his experimental stages and plans regularly to cast his own aluminum bases, he will find that the continued use of the ordinary investments found on the market will be unnecessarily expensive. It is far more economical for the dentist to make his own investment. To be satisfactory, an investment should be firm when set and not easily broken, heat-resisting, and sufficiently porous to allow the escape of steam while drying out and to allow the escape of air during the casting process. The ideal material would neither expand nor contract—the best material approaches this ideal as closely as possible. In order to get the desired degree of integrity, plaster is used (this is true of all investments); porosity is secured through the use of sand, which also provides the desired heat-resisting quality; silex, also heat-resisting, gives a smoother cast. We find that the following formula gives the most excellent results:

Cast plaster	2 lbs.
Sand	3¼ lbs.
Silex	1¼ lbs.

The cast plaster should be of the lumber-yard variety or of that obtainable from a dealer in builders' supplies. The cast plaster ordinarily obtainable from dental supply houses is too highly calcined; it has remained in the furnace so long during the process of manufacturing that some of the desirable qualities have been burned out, making it finer in texture but less suited for our purpose. The sand is known under the trade names of white lake sand, glass-grinders' sand, tile-setters' sand and McComb sand. It may be obtained from the larger dealers in plate glass, and always should be sifted to insure the removal of foreign particles or any coarse sand that may have become mixed with it. The silex is the XXXX Brand used by painters as a filler for hard-wood floors and is carried in stock by all paint houses. These ingredients should be thoroughly mixed and well shaken together. The investment, when water is added, should be more thoroughly mixed than plaster, and should be poured just at the moment it shows a tendency to set.

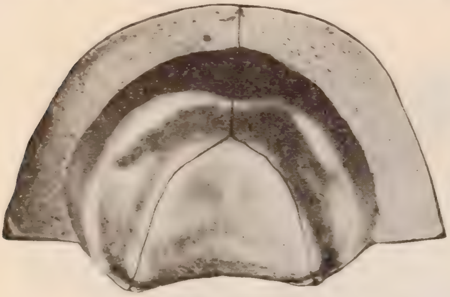

Fig. 6

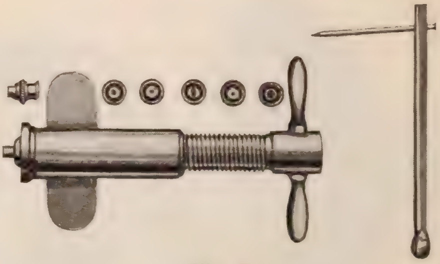

Fig. 7

Fig. 6—Sectional plaster impression ready for pouring duplicate cast.
Fig. 7—Wax sprue gun; on right of cut is shown a match and pin used to heat the wax wire ends to form balls or knobs to increase retention.

The modeling compound impression, which was polished by scrubbing as previously described, *is thoroughly dried* and then poured with this investment material. The duplicate cast should be about an inch in thickness so as to avoid any tendency to fracture while the wax pattern is being adapted. When the investment material has sufficiently set, the Britannia metal tray is removed, after which the compound is removed with the use of dry heat. The cast is trimmed neatly so as to remove any particles that might become incorporated in the wax pattern during the process of adapting.

THE WAX PATTERN

In making the wax pattern, any wax that will burn free of residue in an open flame may be employed successfully. However, the S. S. White thin beeswax base plate sheets, (18 gauge) is the kind we regularly use; this together with a wax sprue gun for making wax wires, a spatula, a knife and a clean sheet of paper upon which to lay these, will constitute the required equipment. If any other wax is employed that is too thick, it may be run through the gold rolls after these have been oiled to prevent sticking.

The wax is warmed slightly over the Bunsen flame and adapted to the duplicate cast, beginning with the palatal surface, taking care not to stretch the wax and make it too thin. Where it is too thin, the cast will show through with a whitish effect; these places should be thickened, using wax from a hot spatula. The labial and buccal borders of the wax are pressed firmly against the cast and the excess material cut away with a warm knife blade. The entire border of the wax pattern is now sealed to the cast with the use of the hot spatula. A 14-gauge wax wire is expressed from the wax sprue gun and, beginning at the posterior buccal border it is laid against the wax pattern and brought over the crest of the ridge at a point a quarter to a half inch from the posterior border; it is then carried along a line that would represent the gingival border of the natural teeth on their palatal aspect. This wax wire terminates on the opposite side of the cast in a fashion symmetrical with the contour on the beginning side. Formerly we continued this wire along the labial and buccal peripheral borders, but the resulting castings can not be swedged to adaptation at these points so readily when these borders are thus thickened. The wire in position, as described, is sealed along the palatal surface of the wax pattern in such a way as to make it an integral part of the palate. This palatal surface should then be

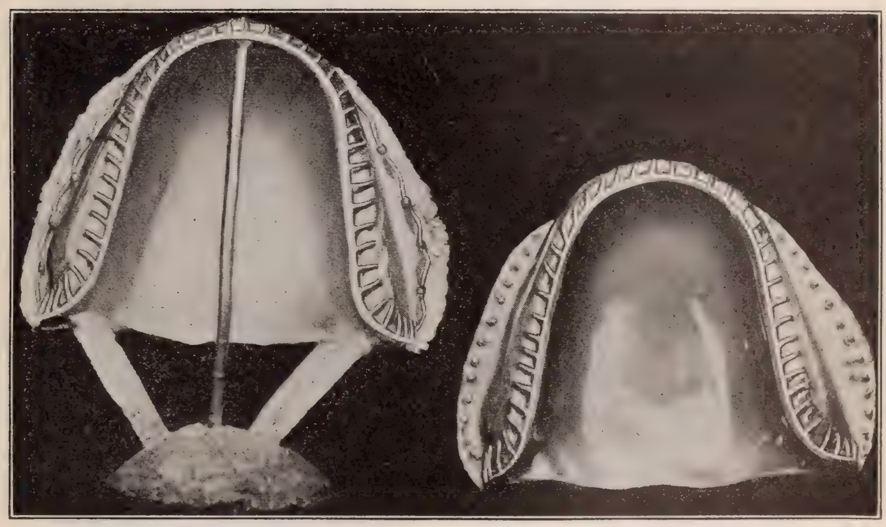

Fig. 8—Two aluminum bases: one on left shows unfinished casting; one on right shows a finished base. Note the two forms of vulcanite retainers.

made as smooth as possible by projecting a flame against it very lightly with the chip blower. For this purpose a yellow flame is best.

Wax wires (20 gauge) are placed upon the lingual border, bridging over to the crest of the ridge and appearing in the finished base, as shown in *Fig. 8*. The buccal and labial borders are furnished with a different kind of attachment so that these borders may remain thin and thus lend themselves to an easier adaptation in the case of the aluminum base upon the cast. These attachments are made through the use of short pieces of wax wire, three millimeters or one-sixteenth of an inch in length, attached to the wax pattern at intervals of about three millimeters in such fashion as not to interfere with the subsequent alignment of the teeth. Holding the wax wire in the left hand, the operator touches the end of it against the wax pattern, and with the heated spatula laid lightly against the pattern at the point of contact, seals it in position, and then uses the spatula to sever the wire at the desired length. The ends of these wires are "balled" by using a common pin to which a match is attached for a handle; this is shown in *Fig. 7*. Of course, this instrument may be made of copper and very much elaborated, but a common pin is equally serviceable and also in keeping with the writer's practice of employing simple instruments where the results are as easily and satisfactorily secured. A spatula may not be used for this purpose, because the wax adheres to it instead of melting down upon the wire to form the ball or knob desired.

In forming the sprue a piece of wax about three-fourths of an inch in width is cut from the end of a sheet, folded lengthwise upon itself, and the open edges sealed together; this is then folded across itself to form a right angle, and the inside corners cut off to bring the ends parallel with, and so that they may be abutted against the posterior border where the heated spatula is used to make the sprue a continuation of the wax pattern. An auxiliary sprue wire is made of ten gauge or twelve gauge wax wire and attached at the crest of the wax roll which forms the border of the palatal surface; the anterior end is attached at a point in the median line and the posterior end is joined to the angle of the sprue. This auxiliary sprue may also be joined to the posterior border of the pattern in the median line, using a short piece of this same wax wire. Care must be taken to seal the sprue to the portion of the duplicate cast that extends beyond the wax pattern, in order to avoid forming any crevices that will fill with investment, and which, when the burning out process is finished, will leave spines of investment for the inrushing metal to break down and carry into the interior of the mold, thus resulting in an imperfect casting.

The duplicate cast is trimmed to size for the cow-bell flask so that when invested the sprue will rest slightly below the open end of the bell. All exposed portions of the duplicate cast are now trimmed to present a clean surface in order to assure a close union with the fresh investment.

INVESTING

After spraying the wax pattern with a solution of equal parts of ether and alcohol for the purpose of removing the greasy film left upon the surface as a result of handling, the cast with the pattern upon it is submerged in a pan of water to allow it to become thoroughly saturated that it may not extract moisture from the new investment material with which it will be surrounded. The holes in the base of the cow-bell are sealed with pieces of wax and the inner walls of the bell moistened with water.

Sufficient investment material (the same as that out of which the duplicate cast is made) to fill the cow-bell is mixed to a thick creamy consistency. The duplicate cast carrying the wax pattern is removed from the water and the excess blown off; it is then pressed into the investment, lifted out and the material which adheres is jarred to place against the edge of the bowl, while the pattern is held in a horizontal position. This operation is repeated until the entire surface of the pattern is covered. The remaining investment is poured into the bell until it is about three-fourths full; now, with the left hand holding the base of the bell against the bench at an angle of forty-five degrees, the model, held in the right hand is brought down vertically into the investment until the cast touches the side of the bell, when it automatically assumes under further pressure a position parallel with the sides of the bell flask. The duplicate cast is supported with the right hand while the flask is jarred to enable the pattern to settle until the end of the sprue is slightly below the open end of the flask; the jarring is continued until the fingers are entirely withdrawn. *Fig. 9* shows this position.

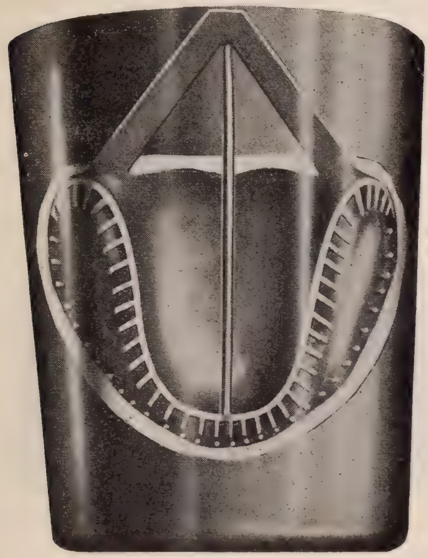

Fig. 9

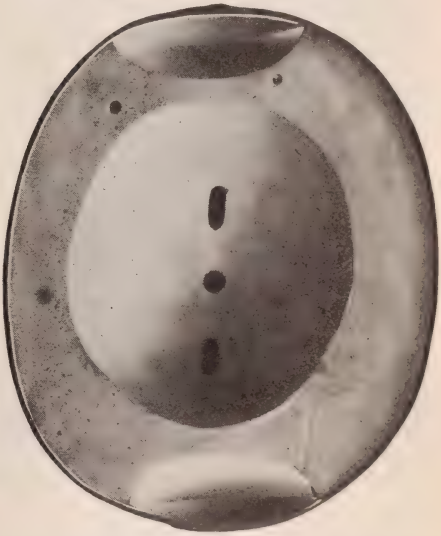

Fig. 10

In three or four minutes the investment is set until a crucible may be cut out, using a large vulcanite scraper. This crucible is shown in *Fig. 10*. The crucible should be cut down until the sprue appears at the bottom of it and then should be widened in ovoid shape until the sides are within a half-inch of the sides of the bell. Sufficient investment is cut away near the holes in the bell to admit easily the hooks of the casting chain. The crucible is now washed in running water to remove any loose particles. It is then inverted over a low gas flame or placed in the electric furnace to burn out.

THE COW-BELL METHOD OF CASTING

The cow-bell method of casting aluminum bases was originated by the writer early in 1907, subsequent to Dr. Taggart's announcement of his method of casting gold in January of the same year. The flask in which the case is invested for casting is a No. 4 Hoosier cow-bell. This is supplied with a brass safety chain to use in swinging it. The cow-bell as it comes from the hardware store is adapted for this purpose in the following manner: The strap of the bell is held in a vise and pulled off; the head of the rivet that holds the clapper is filed off, the clapper driven out and the bottom straightened up with a hammer. Near the mouth of the bell on each of the narrow sides a small hole is drilled to receive the hooks of the chain. These hooks are made of baling wire and about six inches from the loop in the chain, which serves as a hand-hold, the links are bound together with a smaller piece of wire. With the

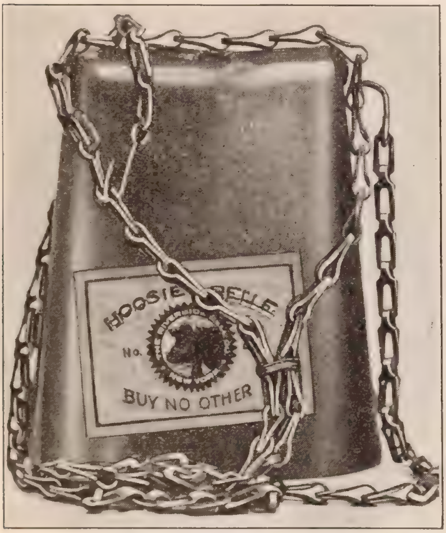

Fig. 11

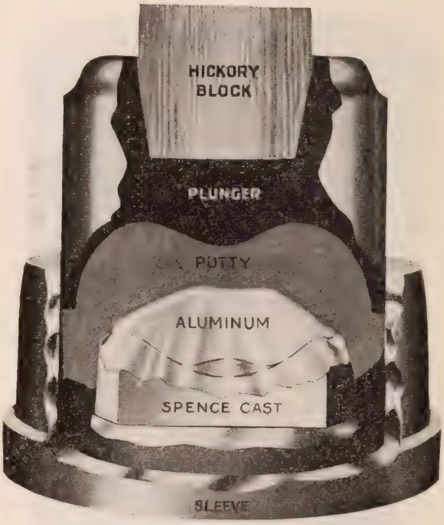

Fig. 12

Fig. 11—The cow-bell casting device complete.

Fig. 12—A schematic drawing of swedger showing aluminum base and Spence cast in position for swedging. The cast rests upon a bed of putty a half inch thick.

chain fastened in this way, the bell is prevented from tipping and thus spilling the molten aluminum. *Fig. 11* shows the cow-bell casting apparatus complete.

If the cow-bell flask is placed over a large gas burner to burn out, it is allowed to remain at low heat until the wax begins to flow, when the flame may be increased as much as possible so as to shorten the time. When no discoloration remains around the sprue opening, it is removed from the flame and placed against a vulcanite flask or soldering block for support, where the hooks of the casting chain are inserted. The ingot of aluminum which has been heating alongside of the flask over the flame is now placed in the improvised crucible and a sufficient amount melted with the presto-lite torch. When the aluminum has assumed a rose-red appearance, the blow-pipe is shut off, the chain adjusted to balance properly when held in the hand, and the operator very deliberately steps to the center of the room and with his arm extended, he makes a full-arm swing before his face, similar to that which we employed as boys in swinging a pail of water. The movement is continued until the metal has thoroughly crystallized. It is then allowed to cool for a few minutes before putting it into water.

After taking the casting from the flask, all investment is removed except that which lies beneath the grids or attachments; this is allowed to remain until the swedging process is completed.

With heavy plate shears the sprues are cut off and any surplus metal along the border removed with the use of abrasive sandpaper wheels. The intaglio is examined and any beads of aluminum are removed with a small vulcanite scraper.

The casting is now forced on to the original Spence cast, and, using a horn mallet and a soft pine stick, the periphery is swedged and burnished and special attention given to the posterior portion. After this preliminary adaptation, the base, in position upon the cast is covered with a piece of rubber dam, put into the putty swedger (*Fig. 12*), and swedged with one blow from a fifteen-pound sledge hammer. It is then removed and examined; in cases where further swedging is required the blow is repeated, but in no instance should the case be struck a second time without previous examination to make sure that the cast has not been injured.

After removing from the cast, the base is further polished with cloth wheel and pumice, or with a patented preparation known as Radoff and Shurshine. A stiff vegetable brush and soda ash are used to scrub out the investment from beneath the grids and to cleanse the base. With a piece of cotton on the end of a match the intaglio is now etched with hydrofluoric acid.

Finally, in order to provide a definite line against which the vulcanite may be finished, a carborundum stone on the lathe is employed after the polishing has been completed.

In concluding this article it may be well to correct a very widespread impression that aluminum bases are lighter than other bases. The specific gravity of aluminum ranges from 2.5 to 2.7 while that of vulcanite is from 1.15 to 1.75.

A DISCUSSION OF FACTORS THAT MUST BE CONSIDERED IN DETERMINING CONSERVATIVE OR RADICAL DENTAL TREATMENT*

BY CHALMERS J. LYONS, D.D.SC., ANN ARBOR, MICH.

ONE OF THE MOST IMPORTANT ADVANCES which has been made during the past decade in the science of medicine, which in its broadest sense must include all branches of the healing art, has been the development of knowledge concerning the role which disease in one part of the body plays in the etiology of disease in other parts. The recent advances in dentistry have brought this field of work into very close relationship with that of medicine. These recent advances have been stimulated by the demands of our sister profession that the dentist must assume some of the responsibility for the effects of some of the low-grade infections.

The conscientious internist today takes into account the condition of the mouth in formulating his diagnosis in a large variety of medical cases. It is equally necessary for the dentist to make a careful survey and inquiry into the general condition of the patient before deciding upon dental procedure. Some of his patients will require thorough and radical dental treatment, while with others a more conservative measure will be preferable.

During the past two or three decades the conservation of tooth structure has been pressed home to the public at large so forcefully, that until within very recent years it was hard to find a dentist who would advise extraction of a tooth, or a patient who would submit to such an operation. During those past two or three decades, the years before the dental profession realized the importance of focal infection, when the knowledge concerning the relationship of mouth infection to systemic disease was in its infancy, the profession's main purpose was to conserve tooth structure. As a result of the extensive conservation of tooth structure many of our patients are now suffering from conditions that are far more serious than those localized in the oral cavity. As a further result of the profession's efforts in the past to conserve teeth, we are today confronted with a condition which threatens to destroy conservative dental treatment. Today the pendulum is swinging out too far in the eradication of teeth for the purpose of relieving some systemic lesion. The dental profession today is standing upon slipping places, and we will do well to keep our feet on the ground.

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*Read before the Tennessee State Dental Society, May, 1920.

The dentist now must take a much broader viewpoint of his profession. It is a question whether dentistry as a whole, even now, after all that has been written on focal infection, appreciates the magnitude of its responsibilities. It is to be regretted that there are still hundreds of dentists who believe their responsibility begins and ends in conservation of tooth structure. When a patient presents they seem to feel that their responsibility ceases when they have examined the teeth for dental caries. They do not feel they are responsible to that patient for any other lesion that may be present in the oral cavity. They fail to examine the mucous membrane, cheeks, tongue, tonsils, sinuses, salivary glands, etc. They fail to get the patient's history of past or present illness; they do not take into account the resistance of the patient to disease.

They prosecute the same general dental treatment for all classes of patients. What would we think of a physician giving the same size doses of medicine to all of his patients for all diseases? This is exactly what by far too many dentists are doing and then we wonder at the criticism that we are receiving. It has been well said that "a dentist would be a better dentist if he were a better physician," and that saying never has proven so true as at the present time. It seems to the writer that the highest aim for the dentist of today is not merely to be a good dentist but to be a good dental diagnostician. If he is a good diagnostician he cannot help but be a good dentist.

In order to make a judicial diagnosis, a broad viewpoint of the patient's physical well-being must be considered in each individual case. There are certain conditions which predispose to disease that must be taken into consideration. It is a well known fact that whatever is capable of damaging the structure of any organ or tissue of the body or of interfering with its function, may be a cause of disease. Consequently all of those factors which would tend to lower the resistance of an individual must be considered in making our diagnosis.

One of the weakest links in the chain of diagnosis in dentistry today is incomplete histories. What should the history of dental cases include? *First*, the age of the patient. This is a vital factor in determining the character of dental treatment to be pursued. Age has a most important influence as a predisposing factor of disease. There seems to be a definitely-acquired immunity in the young to certain diseases that is not possessed by those of middle and after life. This seems to be especially true in those diseases originating in focal infections. The resistance of the young seems to be sufficient to overthrow the vicious effects of certain pathogenic organisms, and they will tolerate conditions in the mouth and jaws that would not be permissible in older patients.

In the natural order of things, as an individual grows older, this power of immunity is lessened and the natural resistance to disease becomes weaker. It is a clinical fact that the process of repair of tissue becomes less rapid as the individual advances in years. These are principles that the dentist must observe and be guided by in determining the character of his dental treatment.

Hygienic conditions is another factor that must be considered. One of the most common causes of disease is lack of cleanliness. In some of our patients it will be well to inquire into their mode of living.

Occupation is another factor. How many dentists inquire of their patients anything about their occupation? As a factor in the etiology of disease, occupation acts in two ways: *First*, in exposing the worker to certain deleterious influences; *second*, the conditions of life in which certain occupations are carried on, such as ventilation, exposure to cold, excessive use of particular parts of the body, physical or mental exhaustion, deficient exercise, irregular feeding, etc.

History of previous disease is another point that should become a part of the complete history of the patient. Previous disease often predisposes to the same or other affection, and no clinical history is of value unless it includes an account of former illness.

Diet has a great bearing on the subject of health today. Food and drink may by their use and abuse excite disease, either by excess of food or want of food. Many affections of the gastro-intestinal tract are superinduced by the diet of the patient and can only be corrected by the proper use of proper foods. Now we come to the disability of the patient. What are the predominant symptoms, if any? These should be a part of the record. The date and mode of onset and treatment that have been given for the condition, habits, susceptibility to colds, fatigue, rheumatic tendencies, etc. should all be inquired into. These will all be an aid in formulating our diagnosis of the case. Such a record should be made of many of our patients before determining upon the character of dental work to be prosecuted.

It marks a great step forward in health preservation that the many scientific researches and recorded observations which have been brought forward during the last decade, have served to prove that there is a most important relationship between certain diseased conditions about the mouth and systemic disease. Yet we must not overlook the fact in formulating our diagnosis that the mouth is only one of the places where we may look for the origin of these low-grade infections.

We find the origin of these low-grade infections of the body in, *first*, the genito-urinary tract, which includes the kidneys, bladder, prostate, urethra, seminal vesicles, uterine tubes and ovaries; *second*, in the gastro-intestinal tract which includes the stomach, gall bladder, intestines and appendix; *third*, in the head and neck which includes the gums, teeth, tonsils, nose, accessory sinuses and the ear.

When a patient presents suffering from these low-grade infections all of these places must be taken into consideration in an endeavor to ascertain the source. This shows how complex the problems of focal infection are.

During the last decade volumes have been written on the subject of focal infections. It has been clearly demonstrated by the pathologists that many of the heart, kidney and joint lesions have their etiology in low-grade infection originating somewhere in the body. There is no question but that the subject of focal infections should be considered more seriously by both the medical and dental professions, and a united front should be presented to acquire a greater knowledge of them so that they may be better controlled.

The records of the Bureau of Vital Statistics for the past twenty years are most interesting. First we see the average length of life per individual greatly increased. In studying these mortality statistics carefully, we find that the causes of deaths in some of the columns are increasing, and in other columns they are decreasing. For instance, there seems to be a falling off in deaths due to certain diseases such as tuberculosis, typhoid, cholera and small-pox. As we continue the study of these columns we find an increase in the number of deaths from heart and kidney lesions and those due to arteriosclerosis and anemia.

It is interesting to review some of these statistics. In the registration area for deaths in the United States, the vital statistics show the death rate per 100,000 population from diseases of the circulatory system in 1901, was 161.2; while in 1917, it was 201.4; deaths from disease of the kidneys in 1901, per 100,000 population was 97; while in 1917 it was 107.4. It is interesting in studying these statistics to observe that each year seems to show a gradual increase in numbers.

It is also interesting to observe the statistics in these diseases when there has been an effort made to get them under control. As an example, the death rate from tuberculosis per 100,000 population in 1901, was 192.6; in 1917, it was 146.3. Typhoid shows a more morbid decline. In 1901, the death rate per 100,000 population was 32; in 1917, it had dropped to 13.4.

Quoting from professor Martin H. Fisher, of the University of Cincinnati, he says: "Many people are dying today from certain diseases too frequently regarded as a necessary accompaniment of old age." "In my opinion" he says, "old age is not so much the cause of many of the pathologic changes attributed to it, but these changes are the causes of old age. There is a physiological death, but I question very much from the people and patients that I have seen whether a physiological death ever occurs much below one hundred years. The question now arises, if we no longer die of the old causes and medical men concede that we do not, then what is it that carries us away in our forties, fifties and sixties? Barring gross accidents and such diseases as cancer and tuberculosis, we now die largely of the direct and indirect consequences of low-grade infection.

"We do not die of acute scarlet fever as we used to; we do not die of acute typhoid or acute pneumonia as we used to, and yet most of us do not die physiologically, that is, of old age. In many cities where formerly there were hundreds of cases of typhoid, today there are hardly enough to demonstrate the disease to medical students, but many of those who have been spared typhoid die by newer causes. These newer causes of death are subtler forms of infection and subtler types of disease. They are largely systemic infections, low grade in their origin, and spring from local causes and are so very small that they are largely overlooked."

Today we have hundreds of people walking about the streets, going about their business, following the pursuits of life, who are neither well nor sick, yet they complain of feeling tired all the time. They have lost their energy. They are suffering from malaise, which is a condition of restlessness with a feeling of being uncomfortable, and is brought on undoubtedly by a certain amount of bacteria and toxines in the blood. This condition is quite common with those individuals carrying alveolar abscesses. The same symptoms may be manifest as a result of infection in any other part of the body. When these patients present for treatment, all sources of low-grade infection in the body must be considered and the infection eradicated wherever found. Dr. Chas. H. Mayo, in an address a short time ago made the statement: "As we see things today, it means there will be far less surgery and less sickness when the full benefit of the knowledge of low-grade infections becomes known."

In running down these low-grade infections we must not overlook the fact that multiple foci are nearly always present, and if we do not get definite and prompt response in eradicating one focus, it means that we have failed to completely eradicate it, or that there are others not yet determined. Still further, the tissues affected may have undergone permanent organic change and the elimination of the foci will not bring about a cure of the conditions. In many of these cases the removal of a single focus will so lighten the patient's load that the body forces will reassert themselves and the phagocytic action of the leucocytes will take care, at least temporarily, of other infections. In these cases a lowering of the bodily resistance from any cause may re-establish the vicious cycle again and the patient will have a relapse. If this be true, then we are doing less than our duty towards the patient where we do not strongly recommend the removal of every possible focus of infection wherever it may be found.

These foci are not by any means easy to determine. A close cooperation between the internist and the dentist will be of great value in running down these low-grade infections.

The time is coming when future generations will no longer die of disease as a result of low-grade infections as we are today, because the source and prevention of these diseases will be known. Periods of progress in both medicine and dentistry have occurred only as scientific and general knowledge have advanced. Wonderful strides have been made in all lines of medicine during the past quarter of a century by the public's appreciation of disease and its prevention. Public health laws have been passed for the control and prevention of disease as well as for the saving of children. Such legislation has played an important role in diminishing the death rate of the nation during the last three decades.

Are we as dentists doing all we can in the great movement for the conservation of health? The protection of human life against its destructive agents becomes less complex when the source and influences of these destructive agents are understood. By this knowledge Gorgas was able to free the Panama Canal Zone of disease, making it one of the most habitable places in the world. The great war was carried on only by prevention and control of disease, and the scientific treatment of wounds.

What is the responsibility of the dental profession today in the prevention and control of disease? It has been definitely demonstrated, first by Hunter, of London, later by Roseneau, Billings, Hartzell, and many other American physicians and dentists that certain chronic diseases, certain acute diseases and special local diseases have their origin in a focus of infection somewhere in the human body. It also has been demonstrated that appendicitis, disease of the gall bladder, and ulcers of the stomach are caused by a mass of bacteria in the capillary circulation at the base of the mucous cells in these organs, and is caused in the same manner from local infections originating from somewhere. It has been further demonstrated that the toxines from certain micro-organisms in the blood play a most important role in the etiology of disease.

As has been stated elsewhere in this paper, there are several sources in the body for the entrance and culture of bacteria in a local focus. In the head we have several sources for the entrance of bacteria. It has been stated by one of our great research workers that the tonsils provide the greatest portal of entry for infection of any place in the body. Diseased teeth and alveolar tissues are undoubtedly great harbors for these micro-organisms. From the laboratory and clinical evidence that has been brought forward during the last five years, there can be no question regarding the relationship between mouth infection and certain systemic lesions. The intelligent dentist today should have no patience with such teaching as has been brought out in a recent paper by an eastern research worker[1] in which he states that he "does not believe systemic diseases upon the focal theory of infection are correctly attributable to the teeth." Quoting further, he says: "If it were true that the teeth were causative factors in the production of systemic disease, there would be few healthy individuals in the world. For example, among fifty thousand cases observed in the Forsyth Dental Infirmary with all varieties of lesions involving the teeth, there was not a single case of endocarditis, rheumatism, arthritis, or other systemic affection which could in any way be attributed to the teeth that I could discover. If the theory of focal infection were sound and correct a great many of these children should have exhibited such diseases, but the fact remains that they did not."

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[1] Howe, Dental Foci, DENTAL SUMMARY, October, 1919.

In the writer's opinion these statistics should be considered far from the final evidence that there is no relationship between diseased teeth and systemic disturbances. Those statistics have been compiled entirely by what has been observed in the treatment of children's teeth. As a matter of fact the greatest factor to be considered in discussing this subject has entirely been overlooked by the author of those statements, and that is the normal resistance of the patient to disease. As a matter of fact the normal resistance to infection in a child is much greater than that of the adult, and they already have an established immunity to systemic lesions as a result of low-grade infections. The records of our own dental clinics at the University of Michigan tell an entirely different story.

Out of eight thousand patients examined, over two thousand four hundred, or thirty per cent., gave history of some systemic lesion such as arthritis, heart or kidney involvement. In a series of cases between the ages of twenty-five and forty-years where there was radiographic evidence of pyorrhea involvement or definite alveolar abscess, fifty-eight per cent. gave history of systemic lesions. It should not be understood for one moment that all of these lesions are attributable to the teeth, and this is the big question today that the dentist and the internist must solve. They must get these three points clearly in their minds. *First*, diseased dental tissues may cause systemic lesions; *second*, there are many other sources of infection in the body than the teeth and dependent structures; *third*, the normal resistance of the individual to disease must be the predominating factor in determining the character of the treatment.

This factor is one that has been and is being largely overlooked by the average dentist and internist. Very few adults are without some form of infection in some part of the mouth, whether the knowledge of the same is present to the patient or not. That serious secondary manifestations are not more common as a result of these foci probably is due to two factors. *First*, the normal resistance of the individual is such that bacterial invasion into the lymph and blood streams is repelled; *second*, the bacteria of chronic processes usually are of relatively low virulence.

If it were probable that the individual's resistance to disease would remain high and that the bacteria in these foci would remain of low virulence, then we would not need to be alarmed over the problems of focal infection. However, Roseneau has shown that these pathogenic organisms may not always remain of low virulence. He believes they have the property of mutation, whereby they may be of low virulence today when the individual's resistance is sufficiently high to take care of them. Later, if the individual's resistance becomes lowered, the future generations of the same low virulent pathogenic micro-organisms may take on different characteristics, and with suitable environment and nutrition may become exceedingly virulent.

On the part of the individual, the resistance to infection may be lowered by a large variety of causes, such as drug habits, tuberculosis, anemia and other blood diseases, disease of the ductless glands, mineral poisons, pregnancy, old age, overwork, lack of proper nourishment, faulty methods of living, exposures to cold, etc., etc. In these patients oral and other forms of sepsis are a greater menace to health than in the cases of normal individuals.

Dentistry today must meet and encounter these problems squarely if it is to take the place it deserves in the conservation of the public health. Dentistry can no longer be practiced as it has been in the past. In the years gone by the profession has been engaged chiefly in the conservation of tooth structure without reference to or knowledge of the fact that in such practice they were subjecting many of their patients to serious systemic disturbances. Today the knowledge of the relationship of mouth infection to systemic disease is known, and there should be no excuse for the dentist to continue the practice of tooth conservation as he has done in the past.

In the writer's opinion we are not yet ready to accept the teaching of some men in the profession, that all pulpless teeth are a menace to humanity and should be extracted. Such teaching should be condemned as vicious and should have no place in modern dentistry. Neither are we ready to accept the teaching that all classes of patients may tolerate pulpless teeth. There surely must be a middle ground for dentistry to take which will lead to a saner and safer practice.

The dentist who will build and mold his practice for the future, a practice which will be safe for his patients, will practice two kinds of dentistry, viz., conservative dentistry and radical dentistry. The determination of the future dental treatments must be based more and more upon the results obtained by a thorough examination of the patient. The dentist must assume a greater responsibility to his patient than the mere restoration of the masticatory organs.

The resistance of the patient to disease must be uppermost in the dentist's mind when treating pulpless teeth. We must not overlook the fact that certain types of patients may tolerate succesfully a certain class of dental work, whereby it would be a failure in another patient of less resistance. If the patient's resistance is low, radical dentistry should be practiced. In the writer's opinion the resistance of the patient to disease must be the great determining factor in the practice of conservative or radical dentistry. There never was a time in the history of dentistry when a close cooperation between the physician and the dentist was as necessary as now. There never was a time in medicine when the physician needed the advice of a dentist as at the present time.

Today the problem of focal infection is one that must be studied by both professions and can only be solved by absolute harmony and the closest cooperation between the two. It is unfortunate today that both the physician and the dentist are placing so much confidence and dependence upon X-ray findings in formulating their diagnosis. They seem to overlook the fact that the roentgenogram does not show a picture of the pathology, but it only shows shadows of conditions which may be present in the tissues. Many conditions may be read into the roentgenogram by the inexperienced. In the writer's opinion the roentgenogram *per se* is of little value in making a judicial diagnosis. The roentgenogram may be misleading many times if there is no other evidence at hand. It may show areas of rarefaction about the jaws that are physiologic rather than pathologic. It may also show rarefied areas that are traumatic and not infectious. It should be used only in conjunction with the case history, physical diagnosis, etc. It should be considered only one link in the whole chain of evidence from which may be formulated a sane and conservative diagnosis.

Our knowledge of the far-reaching effects of low-grade infection should be sufficient reason for eradicating a focus of infection wherever it may be found. Too often teeth are condemned by the physician when the origin of the infection may be in some other part of the body.

A famous internist[2] recently made this statement: "There is no doubt that many cases of arthritis and myositis have been relieved and many eyes saved, and the general health of many patients improved through the reference to dentists who have corrected bad mouth conditions. One error for which the physicians are mainly at fault, is that arising from a tendency to make incomplete examinations. A patient complains of arthritis or other pain, his physician looks into his mouth, sees a few crowns and at once condemns the teeth and advises their sacrifice, and the conscientious dentist has great difficulty in convincing the patient that the crowns are in sound roots. Now the fact is, in a case of this sort the physician may be right, but taking all things into consideration he is more likely to be wrong. What the physician should do is to give the patient a very careful and complete examination with the cooperation of the dentist and then decide upon the course of action. Some years ago many alveolar abscesses remained undiscovered and undisturbed. When the dental and medical professions discovered their omission they went to the opposite extremes. Undoubtedly alveolar abscesses should be relieved, but expert dental judgment is required before condemning teeth on imperfect radiographic evidence."

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[2] Dr. E. E. Irons, Chicago, *Journal National Dental Association*, November, 1919.

There will be many cases where the patient's welfare will be better safeguarded if the dentist cooperates with the physician relative to the physical condition of the patient before the determines upon conservative or radical treatment. Too often the dentist is overly conservative in the treatment of teeth, and will attempt to retain a pulpless tooth in a patient's mouth whose physical resistance will not tolerate it. No attempt should be made to save a tooth, if in so doing it destroys the health of the patient. The writer here wishes to take exception to the statement made by some physicians and a few dentists, that a pulpless tooth acts as a foreign body in the jaws.

Many men in the profession believe that if the pericemental membrane is vital, and if the canals have been sterilized and properly filled, the tooth in question may be retained for many years of usefulness provided the resistance of the patient is normal.

The foundation upon which the treatment of pulpless teeth must stand is based upon three factors: *First,* the amount of pathologic involvement; *second,* the physical condition of the patient; *third,* the possiblity of sterilizing and completely filling the root canals.

If all the evidence shows that the end of the root is not denuded of its pericemental membrane the case may be watched and a series of roentgenograms be taken at stated intervals and compared. The patient should be apprised of the fact that this particular tooth is under suspicion. Here again the general health of the patient must be considered, and the technic of sterilizing and filling the root canals must be considered part of the chain of evidence which must govern our procedure.

If, however, a case presents of an alveolar abscess of long standing, or a case of imperfectly filled root canals with granuloma, where all the evidence points to a non-vital pericemental membrane in the apical area, surgical procedure rather than dental therapy is indicated. At the present time there is no method or medicament that will revivify the pericemental apex. If this membrane be vital, the tooth is healthy; if it be diseased that portion should be eradicated. This is the point in treatment where materia medica should stop and where good surgery should begin.

The character of the surgical procedure may be root resection in favorable teeth and extraction of the tooth in unfavorable cases.

Again we approach the subject of diagnosis. What is to be considered favorable cases for root resection? It is a lamentable fact that many men are resorting to this operation as a short cut method of eradicating an alveolar abscess over a beautiful crown or bridge attachment, without first removing the crown or bridgework and sterilizing and properly filling the root canals.

Thoma in his book on "Oral Abscesses," says: "Apicœctomy is only successful if the root canal has been sterilized and properly filled previous to the operation. It is not sufficient simply to amputate the root where the old filling ends, but the root canals and dentinal tubuli have to be sterilized or there will be reinfection from the tubuli exposed where the root is cut. If it is not worth while to remove a crown and treat the root canal, the tooth should be extracted or there will be a recurrence and the patient is as badly off as before. It is not justifiable to leave a crown on a tooth because it is a masterpiece of art, if the foundation upon which it is built ruins the patient's health." This expresses the writer's views exactly. Too many times this operation is done with the view of saving a nice piece of bridgework when no attempt is made to eradicate the source of the infection. It should be a matter of routine not to do this operation unless the canals and tubuli have been sterilized and filled just previous to the operation. We are not doing good surgery when this is not done.

What are the most favorable teeth for the operation? For some time the writer has been limiting this operation to single-rooted teeth. This limitation has been made for two reasons: *First*, because of the accessibility of these teeth, a clean surgical operation can be performed; *second*, we can be more sure of our sterilization and filling of the root canals. The possibilities (1) of reduced silver in the preparation of roots for resections, seem to give most encouraging results.

The question of sterilizing and properly filling canals in multirooted teeth for the eradication of an infection has been a very doubtful procedure in the mind of the writer, and in his opinion the patient's welfare will be better taken care of in these cases by extraction of the tooth followed by curettage of the bone.

It is possible in a few cases to resect the entire lingual root of an upper molar, or the mesial or distal root of a lower molar and preserve the remainder of the tooth for further usefulness for a limited time. Such procedure, however, is usually only temporary and if the patient is suffering from systemic disturbance the operation should under no circumstances be indicated.

Where the bone and pericemental membrane are diseased from the apex to the gingival margin of the gums, the tooth should be extracted rather than try to save it by root resection. In no case should this operation be resorted to when the tissues are diseased beyond the apical third of the root of the tooth.

If this operation is to take its place in conservative dental practice, our diagnosis will play a very important role. Our whole success will depend upon whether our diagnosis has been correct. The *modus operandi* will avail nothing towards success of the operation if our diagnosis has been faulty.

The welfare of the patient should be the first consideration, and a hasty diagnosis may lead to simply an operation rather than a judicious successful treatment of the condition.

In the final analysis of the subject of focal infections, the duty of both the physician and dentist today is to cope with the situation as it exists now. When a patient presents suffering from some lesion as a result of low-grade infection, all of the evidence should be weighed before determining upon the course of procedure. The physician will refer his patient to the dentist for advice and cooperation, and the dentist must be able to make his diagnosis in a safe and sane manner. Then only will the patient receive the kind of treatment that is due him.

The future hope in dentistry in exterminating focal infection in so far as the mouth is concerned, lies in preventive dentistry. The education of our children in the care of the teeth will be the only means of preventing foci of infection in and about the mouth.

This generation of physicians and dentists must be content in treating the effects of focal infection and to eliminate, so far as possible, the opportunity for such foci to exist, and to eradicate those now existing. Yet their greatest mission will be in educating the coming generations to so care for their mouths and their bodies that the future generations of physicians and dentists will have the problems of focal infection already solved. You and I will not live to see that day. Perhaps many generations will have come and gone before this condition can be realized. However, our lives will not have been lived in vain if we will do our part now in helping to speed the day of preventive medicine and preventive dentistry.

DISCUSSION

Dr. Bogle: I have very much enjoyed this most excellent paper and can only stress some of the points Dr. Lyons has raised.

You might think he was extremely conservative, and yet he indicates to us that where the condition of the patient justifies it, he is radical to the point of common sense. In other words, he takes up the question from the health standpoint and therein lies the treatment of focal infections at present. A very thorough examination and the history of the case are necessary, because you must work up your case thoroughly before you know what the treatment should be. I am one of those who believe sincerely that without a general physical examination in every case of marked foci of infection, we are trying to accomplish something, and yet do not know what that thing is. I believe we should have a thorough physical examination made by a competent internist, following that with a blood count, urinalysis, taking into consideration the condition of the heart, the kidneys, the history of the case, and an examination of all the sinuses.

Too frequently these things are treated without a proper knowledge of systemic conditions. Oftentimes we have confronting us the statement that Dr. So and So has taken out certain teeth after making a radiographic examination. The radiograph is only one link in the chain of evidence; it should be so regarded.

Dr. Lyons referred to the fact that from the absorption of toxins there arose gall bladder disturbances, gastric ulcers, oftentimes appendicitis trouble, and many other things having their origin in the mouth, and that if these conditions were looked after early enough and eliminated, in all probability the patient would have been saved these attacks. Sometimes the patients are promised too much. The fact as to whether or not chronicity has been established should determine very largely what the patient should be promised. We sometimes have a condition started, say joint trouble, and perhaps such a chronic condition has been established that it never will be well. Sometimes a secondary infection in itself becomes a primary source of infection, so that the removal of the primary source does not give the patient the results desired. The matter of the family history and the habits of life of the patient must be taken into consideration.

One thing I believe the Doctor did not mention, and that is that the patient should be questioned as to his elimination. An auto-intoxication plus focal infection sometimes tremendously complicates the situation. In all types of treatment, especially when surgical steps have been taken, elimination also should be carefully looked after.

Dr. Lyons referred to the power of resistance of the patient. That is the milk in the cocoanut, as to how much a patient can stand from any type of infection. We are met sometimes by the fact that a patient will come in with enough infection in his mouth to kill a dozen people, and some of the ultra-conservative practitioners will offer those cases as evidence that focal infections do not kill. That is of course explained by the individual resistance of the patient, and yet we must not overlook the fact that if that patient has been fighting a good battle with the advantage slightly on the side of Nature, with possibly his resistance a little to the good, and supposing that he were stricken with typhoid fever, or pneumonia, or some acute kidney lesion, adding this acute trouble to the already charged system might prove very bad for him.

The reference made to the situation found at Forsythe Infirmary was interesting, yet there are a number of cases where children under fourteen or fifteen years of age have given those same results. Dr. Gillman some fourteen months ago had a first molar become somewhat uncomfortable. He had it opened up and they found some putrescence there. It was treated, and finally the roots were filled. He felt much better and went along for a few weeks, and then had trouble again. He had the tooth opened up and treated again but it was still somewhat uncomfortable, and he had it extracted. When it was removed and the curettage made, he asked for a specimen of the bacteria in the apical areas, and this was observed and a record made. A short time after that he was stricken with acute gall-bladder infection. They were unable to control it, and he had to be operated upon. And there they found the same strain of bacteria that had been in that socket.

Only quite recently we had the good fortune to see the case of a child thirteen years of age, who had a terrific disturbance in the gall bladder. For some weeks she was very ill, and when the condition had slightly cleared up her physician said there must be foci of infection somewhere. He examined the tonsils and the sinuses, and then he suggested that we check up the teeth. The question is often asked, "What teeth should be X-rayed?" In checking up we found a lower left molar with a large destructive process around the distal root and advised its removal. After that it was remarkable to see how that condition cleared up. There was a marked toxemia at first because we had broken down Nature's barriers, and the patient had absorbed quite a good deal of toxin at the time. We only assist Nature. We do not cure anything, and if Nature doesn't come to our assistance the case cannot be relieved.

In the handling of cases, again referring to physical examination, oftentimes where we find a focus of infection, the physician and the dentist agree that those conditions are to a great extent responsible for the systemic condition, and the physician may point out a blood pressure that is extremely high. Whether the infections are responsible for these things or not, in the type of hypertension we are called upon to treat, we must not overwhelm the patient with bacteria. That may increase the dangers that already exist, and cause more trouble than do good.

Another condition we sometimes meet. We must begin as dental surgeons to determine what a color index means. Take a patient who is very anemic, or a person whose color is muddy, or a patient running a low temperature with low-grade infections, we must take into consideration the possibility of some secondary or systemic disturbance. We had a case come to us for an operation. Examination revealed the fact that he was a diabetic; he was rather disturbed because we would not operate. Gangrene probably would have set in in his case, so we let him alone. We treated him for the diabetic condition, and we have been able to assist Nature considerably, and the patient's condition is clearing up rapidly.

I would put Dr. Lyons in the class of not ultra-conservatives and not radicals. He is a common-sense practitioner of dental surgery, and the use of good judgment and common sense based upon clinical findings would be his motto. I want to thank him again for this very fine paper.

Dr. Steele: It is often a question in these cases of whether it is the teeth or some other foci. I often have seen teeth where the pus was oozing out, and I have wondered why they didn't have arthritis. Then another patient would come along with a very little tooth infection, suffering from gall-bladder trouble or something else, and when the tooth was taken out and the tooth condition cleared up, the patient was relieved right away.

I cannot understand why at times, when you clean up the sinuses and the teeth in order to better the gall-bladder condition the patients do not get better. I suppose we do not strike the foci. We do the work and get no results.

I also believe that in connection with the involvement of the antrum is another place where the dentist and the physician should work together. I just want to say in closing, that I am getting stronger for having a dentist look patients over with me, and I believe we should work very closely together.

Dr. Cotterer: I recently heard Dr. Greaves make an interesting statement. Dr. Steele wonders why we do not get more prompt and more permanent results. Dr. Greaves said he believed we had all been puzzled by the recurrence of these systemic conditions, and that he believed patients once subjected to systemic infections of this low-grade type, instead of becoming immune to them, become desensitized. He makes that statement after long observation.

We all have noticed these recurrences and wondered why it was, when seemingly we had cleared up the entire system. I said to Dr. Greaves, "I am firmly convinced that some of our old-time theories still hold, that there are other causes for arthritis than infection." And he said, "Yes, and our medical men are beginning to find it out." I do not question that infection is important in the production of systemic disturbances, but somehow we seem to have lost sight of the intestinal tract as a factor in the production of these diseases. Long ago we thought all of those troubles came from faulty metabolism, and I believe some of those conditions still exist. Dr. Lyons' plea for a thorough examination is correct, but these other factors must not be neglected.

Dr. Anderson: If Dr. Lyons has done no more than emphasize the importance of bringing the physician and the dentist together, his time here is not illy spent. Some dentists jump at dental infection and insist on pulling every tooth, and I believe many times the tendency is to pull too many teeth and forget the other foci of infection. The gall bladder, the appendix, the prostate, the intestinal tract all should be considered. The physician and the dentist must work together in this thing. Mayos have recently reported eleven thousand cases treated for focal infection. If you pull a tooth or remove a tonsil how soon may we expect results? They say a great many will be relieved in six months, many in three months; the average will be six months, and many will require twelve months. That may answer many questions for us that we may be called upon to answer.

Dr. E. R. Hart, St. Louis: I wish to compliment Dr. Lyons on his very able paper.

In speaking of radicals and conservatives, I suppose I should be classed with the radicals. After sterilizing a tooth, if such a thing is possible, it seems to me that the radiographic finding is not of sufficient value to depend upon it solely in determining the condition of the tooth and surrounding tissue. To determine the pathogenicity of the apical area, it is necessary to aspirate these tissues. We cannot obtain prima facia evidence of the lack of pathogenicity of the apical area by depending upon smears made from root canals of teeth that have been previosuly treated with medicaments. Teeth that have been treated with medicaments and tentatively diagnosed as sterile, after extraction and upon culturing, have given luxurious growths of pathogenic micro-organisms. All of which might lead one to conclude that root-canal therapy of the present is inefficacious and empirical.

For the proper handling of these conditions, there must obtain a very exquisite technic, supplemented by a well-founded knowledge of bacteriology and pathology, which I do not think obtains in a fraction of one per cent. of the offices in which root-canal work is being attempted.

There isn't a fight on between the so-called radicals and conservatives. This is a matter for humanity's sake. Let us try to solve this, and if any man will show me by bacteriological findings that pathogenic bacteria are eliminated, to him I say, "Amen." I formerly was a great believer in root-canal treatment, but today, realizing the impossibility of obtaining dependable material from apical regions by way of root canals which have been medicated, do not feel that we have a moral right to say, "All is well," when we are so much in doubt that we keep checking back.

DR. TRAVIS: Wherever we suspect focal infection the dentist and the physician should get together. We often have found that other conditions are quickly removed when the focal infection was thoroughly removed. When the condition is not relieved, there must be a focus of infection left. We have noticed after operations, where there would not be a total cure, that there were probably other foci of infection.

This question of focal infections is one of the most important that presents itself to the professions today, both medical and dental.

DR. CHARLES CHANDLER: I am what Dr. Lyons would call a radical. In our root-canal technic and work it is always watch, watch, lookout. Why? In our root-canal work we have done the best we could. I have loved that work and have studied it, and I have followed out the technic of checking. Why? Do you medical men, after you perform an operation, want your patient back every two or three months for a ckeck? We do. We are afraid we have guessed wrong.

The diagnosis so far as focal infection is concerned has been laid down by a number of men, as to what shall be the cases where we may attempt root-canal work or what we may risk. If we have a patient of a certain constitutional resistance, we may. I think Dr. Roseneau has said in root-canal work, if we have a case of perfect physical condition and remove all particles in the root-canal, and fill aseptically the root canal perfectly to the apex without creating any pressure on the surrounding tissue, we might have a right to do it. Can you do that? I believe not. Have we a right to guess at these things? I do not think we have.

If we remove a tooth, do we remove the infection or do we just pull a tooth? Do we curette and remove all parts of infected tissue, or pull a tooth and say "Good bye" to the patient? One of the great points with us is whether we are surgically doing our work as we should.

Secondly, should we do that as it should be done, or should we not have had it to do by getting rid of that root before it is put in that condition? I realize of course, that the man that is taking a radical point of view is not popular. We cannot see the point to do what deep down in our hearts we know we should do. In these cases where we have put a patient in jeopardy or the patient is in a critical condition, and we have done some work on a root canal that is questionable in our mind, do we wish we had done a different operation? We all have felt that way. Why don't we do what we know in our hearts is best, and that is not to guess? If you were patients, how many of you would stand for the dentists' guessing? Should we put this up to the patient, or should we remove all this condition, explaining it to the patient beforehand, or take this trouble and hope we are guessing right?

DR. CHARLES LOKEY: I am one of the radicals. Gingivitis and pyorrhea have not been touched upon, and I believe much infection is overlooked in the gum tissue. You will find conditions there that look similar to the granuloma that you find at the apex of a tooth.

I believe too much stress is placed on the X-ray, and we sometimes overlook other issues. We should remove all foci of infection, tonsils and all other foci. I sometimes think we should place the patient on the table, start at the foot and go clear to the head, and remove all the foci.

DR. TOWNER: Dr. Lyons did not say more about the infection of a root canal and its sequela than about other foci of infection and their treatment. He pleaded for conservatism based upon a broad and practical consideration of the subject. This cannot be gained if you confine your attention to the oral cavity alone. We have the dental apparatus, investing tissues, tonsils, and accessory sinuses, all, or any one of which can be a focus of infection; therefore, the dentist who confines his attention to the oral cavity or more particularly the dental apparatus, is not going to see broadly, and this restricted vision will not qualify him to make accurate diagnosis.

When it comes to the question of the treatment of root canals, I never have heard a man discuss the subject except by using the qualifying, "if." "If this, or that, condition is favorable, then conserve teeth." This "if" is nothing more or less than the variable resistance of the patient to disease. We may have high resistance today and low tomorrow. The whole cycle of life revolves around this phenomenon of resistance.

If we have a devital tooth with its liability to infection and its many avenues of transporting this to different parts of the body, the variability in resistance to that possible focus must determine the factor of safety. There seems to be nothing clearer than this. I have yet to see a tooth root filled or a pyorrhea pocket treated, which I believe will remain healthy longer than six months under the detrimental influence of lowered resistance. There always is a suspicion and the necessity for checking.

Dr. Greaves has said that in his observation of patients in Johns Hopkins Hospital, he had discovered that those of limited means who occupied the charity wards, with no previous access to the dentist except for the removal of diseased and painful dental organs, manifested the least evidence of secondary infection from mouth foci. Those of the middle class who did have opportunity to have dentistry done, but who went to the indifferent practitioner, manifested a greater degree of infection and secondary symptoms; while those who were unlimited in their ability to have the best dental services rendered, were sicker from secondary infection than all other patients; in nearly every case the cause being traced to the dental apparatus.

This question of focal infection is analogous to a vicious canine, in that one must determine his actions by a proper estimate of the dog's disposition and his own power to resist a possible attack.

The beautiful and appealing thing about this discussion is that it broadens the dentist's vision, and elevates his ideals. It leads him to the field of medicine. It brings the man of medicine closer to the dentist and focuses his attention for a time on the mouth, thus strengthening the link that binds the two professions into a unit for the relief of human suffering.

DR. LYONS, (Closing): If has been unfortunate for dentistry that different sections of the country are divided in their opinion on the subject of focal infection. A year ago I read a paper in the East on the subject of focal infection, and was criticised for being too radical. I read the same paper in the West two weeks later, and was charged with being too conservative. The trouble has been that we haven't given this enough study. I quoted two men in this paper, one from the East and one from the West. Neither of these teachings should be accepted by the dental profession. It has been gratifying to us in the Middle West that we have seen a change come over the men from the Far West, and have seen a change gradually come over the men from the Far East. In the Middle West we have tried to take a middle ground, to teach that the physical condition of the patient is the primary factor in considering the subject of when and when not to extract.

Within the last few months some of the men that were so radical a few years ago, have come out with articles saying that many teeth have been extracted that should have been saved. Men in the East have come out with statements saying they have saved entirely too many teeth.

The kind of root-canal work that the dental profession has done in the past must cease. If you cannot sterilize and completely fill a canal, extract the tooth.

What would you do in the case of a young woman eighteen years of age, in perfect physical condition? Suppose she has lost the pulp in a central incisor. Would you extract it? By all means you would try to save it.

We must save the single-rooted teeth. I don't care so much about your molars and bicuspids; they can be restored. But I do care about the anterior teeth. Infected teeth must be eradicated, but if you sterilize and fill your root canals, I do not believe they will make trouble.

As to why we do not get prompt results there are three reasons: *First*, we have not eliminated the focus of infection; *second*, there are other foci that we have not eliminated, and, *third*, those foci may have produced permanent organic changes in the body, so that even if you remove the foci you do not get results.

I wish to thank you for the courteous treatment accorded me in the discussion of my paper.

DENTAL DISEASES AND THEIR PREVENTION

BY RAOUL H. BLANQUIE, D.D.S., SAN FRANCISCO, CAL.

(Written for THE DENTAL SUMMARY)

THE CHIEF CONCERN of dental science in the past has been to restore damaged tooth substance and to replace lost teeth by artificial means. Little attention was given to measures tending to prevent such conditions coming into existence. Even after the discovery of the causes of caries by Miller, little thought was given to preventive measures.

It is of interest to note that examination of the teeth of uncivilized races, such as the Maoris of New Zealand, disclosed the fact that dental caries and periodontal diseases were found to exist in so low a percentage as to be practically negligible. Among the Eskimos of Alaska, before the advent of the white man with his advanced modes of civilization, the same conditions were prevalent. This is now fast changing, caries and pyorrhea being found about as common as among civilized races. This phenomena can be attributed principally to the diet. The foods eaten by the aborigines consists chiefly of coarse granular substances, which upon trituration mechanically cleanse the tooth surface and gums and harden these through stimulation.

Carbohydrates and pre-digested foods which form such an important part of our modern diet have contrary effects upon our teeth and gums. Our foods in general lack the quality of coarseness which demands thorough trituration, and added to this, must be considered our large consumption of sugars which play such an important role in the formation of caries. With these appalling conditions confronting us, is it to be wondered that so many mouths are found to be in a deplorable state?

It is logical to assume that the first step in inaugurating prevention would be to regulate the diet, so that only proper foods would be ingested. Since, however, we might as well endeavor to make the earth rotate in a reverse direction as to try and dictate to the masses of people the needs to their welfare, the practical solution to the problem must be found in permanent prophylactic measures. It is only very recently that much thought was given to this subject, when the investigations of Doctors Rosenow and Billings conclusively linked oral foci of infection with systemic diseases, then preventive dentistry took a new and broader meaning—it meant also preventive medicine.

Commencing at the beginning of dental diseases, we know positively that aside from traumatic injuries, warding off of caries from a tooth generally spells the health and life of the pulp. The death or forced removal of same forecasts future trouble, if not immediate, with the probable ultimate removal of the tooth. Even in the light of our present-day knowledge and facilities there are but very few non-vital teeth that have properly-filled root canals. The X-ray proves this to be an absolute fact beyond any doubt. A pulpless tooth with improperly-filled root canals, being a point of lowered resistance, offers a harbor to hematogenous infection. It is problematical whether a tooth once infected can ever be thoroughly sterilized with its millions of dentinal tubuli lodging bacteria in a most favorable media. These conditions in devitalized teeth have brought about the sacrifice of many of them and not without just cause, and will continue to do so until simpler and more positive forms of treatment have been discovered.

Periodontal diseases, like caries, run a progressive course which should be recognized and arrested during their incipiency; their results are as deleterious to the human economy as to the teeth themselves.

Since we must have recourse to oral prophylaxis as being the practical solution to the problem, we hold that this subject is worthy of our utmost consideration. By oral prophylaxis is meant the rendering of the oral appendages in such a hygienic state that the formation of caries, gingival and periodontal affections will be minimized to a practical degree of immunity. It furthermore means the elimination of existing oral foci of infection, faulty fillings and defective restorative appliances.

It is a very simple operation to cleanse teeth by the ordinary brush and pumice method and remove deposits irritating the investing tissues, but the effects of such a procedure are of but short duration. What is needed is a method imparting permanent results. To accomplish this end it is imperative that the enamel be polished to such a degree that it will afford the minimum amount of retention to mucous plaques, food debris and calcareous deposits, and present beneath the sub-gingival spaces, a smooth non-irritating surface to the soft tissues. The enamel covering a normal tooth is microscopically or macroscopically rough and uneven in surface texture thus enabling the adhering of the above-mentioned elements. Mucous plaques in the presence of carbohydrates produce lactic acid, which in turn causes decalcification of the inter-cemental substance of the enamel. If it is possible for us to establish the surface so highly polished and slippery that the adhering of mucous plaques, etc. is greatly minimized, it is safe to assume that the chances for formation of caries is the same. This also holds true for gingival and periodontal disturbances if we polish the cervix of a tooth, thereby removing the source of irritation caused by the roughness of the enamel which favors the retention of food debris and deposits.

The gospel of oral prophylaxis preached by many of our authorities is still of a very primitive nature and the results generally obtained are but temporary at their best. Deposits, plaques, etc., removed by cups and brushes with some gritty substance, return in but a very short while, as the matrix to which these elements attach themselves has not been improved. What is required is a systematic procedure by which the natural imperfections and roughness of the enamel can be readily removed and its surface made absolutely smooth and slippery.

The dental profession owes a debt of gratitude to Dr. A. W. Ward, of San Francisco, in this instance, for having spent years of tireless effort in developing a practical and scientific method of prophylactic treatment in which the ultra ideals are materialized. More can be gained by a chair clinic than by a description in this line of work, but as circumstances leave us no choice, a brief outline of the method will be attempted. The first step is to properly contour, if need be, the tooth by the use of Miller's mounted carborundum stones of suitable shapes and sizes. With cloth carborundum discs or leather wheels, depending upon the tooth, and a medium coarse abrasive, such as Svelto No. 2, the labial or buccal and then the lingual surfaces are relieved of all roughness and imperfections and smoothed evenly, care being taken to remove but the minimum amount of enamel necessary to obtain the desired result. Pits and grooves can be smoothed out by the use of specially-shaped, mounted walrus points and the abrasive. The proximal surfaces are smoothed above and below the contact point with long garnet strips and the abrasive; here precaution should be taken not to injure or cut the soft tissues nor the peridental membrane. The occlusal surfaces are best treated with mounted leather wheels and bristle brushes with the abrasive, while the sub-gingival spaces, labial, buccal and lingual are reached by flat walrus points mounted on an automatic jigger, and also the use of the abrasive. The polishing is now accomplished by repeating the above procedure, but with a fine abrasive as Svelto No. 4, and the use of moose-hide wheels and cuttle-fish strips instead of the discs and the garnet strips. The cervix is finished off with unwaxed tape and the abrasive. The final luster is obtained with an oxid of zinc preparation. The esthetic appearance of a tooth thus treated is greatly enhanced.

It must be understood that following treatment, patients must continue to exercise the utmost diligence in the daily care of their mouth. They should be intelligently instructed in the proper mode of brushing their teeth which so very few know how to do correctly. Their earnest cooperation is absolutely necessary to obtain the maximum results. The dentist in instituting oral proplylaxis, has but laid down the foundation for prevention and it is up to them to keep their mouth in the condition in which it has been placed.

Although the field for this type of work is unlimited, our greatest efforts should be concentrated on children in conjunction with orthodontia. The nation of tomorrow depends on the generation of today, and our greatest energy should be expended on their health in which the teeth play such an important factor.

501 Lincoln Building.

BACTERIOLOGY OF THE PERIAPICAL TISSUES OF PULPLESS AND VIABLE TEETH*

BY CARL D. LUCAS, D.D.S., INDIANAPOLIS, IND.

RADIOGRAPHIC EVIDENCE plus bacteriological findings from the periapical tissues at the apices of tooth sockets, are a sane and scientifically logical means for the deduction of the true status of patho-histologic conditions existing at the ends of pulpless and viable tooth roots.

Clinical evidence gained by the compilation of complete history findings of cases in which patients manifest systemic sequelæ due to the absorption of toxins from possible foci of chronic infection, is of vast importance.

Therefore our first equitable duty to our clientele may be considered, in a measure, advantageously compensated after we have made complete history records of clinical findings.

These records should include blood-pressure readings, both systolic and diastolic, with the deducted pulse-pressure, blood-count, with differential count and hemoglobin percentage, urinalysis, heart and chest sounds by auscultation and percussion, and the most complete bacteriological determination possible by means of stained smears from lesions, cultural growths and a definite differential determination of the colonized organisms.

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*Read before the Indiana State Dental Society, May, 1920.

From the above hypothesis we realize that the dental diagnostician must necessarily devote a great amount of his valuable time to individual preparation for the duties which become incumbent upon one who may be classed as an eligible in that specialty.

Routine examination of patients seeking oral surgical advice should include:

First, clinical examination of all teeth in the mouth, record of all shell, Logan, Richmond, slipper and jacket crowns, Carmichael attachments, extensive gold, amalgam, porcelain or synthetic restorations and a record of all missing teeth.

Second, condition of gingival and pericemental tissues.

Third, record of neoplastic formations or tumefactions of the gums, bone, mucous or submucous tissues.

Fourth, faradic test record of all teeth, practically applicable.

Fifth, radiographic interpretation of conditions visibly evident at the apices, bifurcations and trifurcations of pulpless teeth, with special reference to osseous rarefactions, lateral, bifurcational, or trifurcational root perforations, pericemental pathological evidence, interceptal osseous resorption, cryptic pathology in sockets from which abscessed teeth previously have been extracted, fractured tooth roots and incompletely-filled pulp canals. Notation of osteosclerotic areas, hypercementosis, systic formations, unerupted, impacted or supernumerary teeth and anomalous conditions.

Sixth, if the patient should submit a history of sinusitis, transillumination of the maxillary and frontal sinuses should be made, and radiographic films and plates exposed and interpreted for record of shadow notation.

Seventh, tabulations should be made of specific lesions of the mucous membrane of the mouth and throat, such as mucous patches, leukoplakia, tuberculous ulcers, sinuses, rodent ulcers of the lips or face, Vincent's angina, *et cetera*.

Eighth, gross anomalies of the mouth, such as cleft palate, hair lip, Hutchinsonian teeth, supernumerary teeth, visible impactions, and irregularities of the arches should be recorded.

Our clinical histories should include notations of the condition of the tonsils, presence of adenoid tissue and gross pathology of the pharynx.

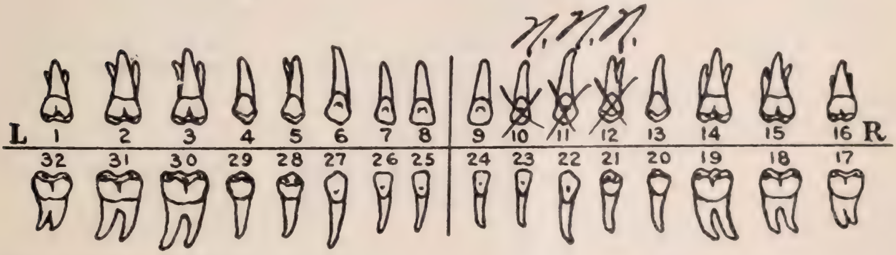
Tonsils should be examined by retraction of the anterior pillars of the fauces with pressure exerted upon the glands, for the purpose of expressing pus or caseous deposits from their crypts, and notation made of visible hypertrophy or submersion of the tonsils. If the tonsils are found to be diseased, the patient should be advised to consult a laryngocologist for final advice in this regard.

The pulse, temperature and respiration should be charted, heart murmurs and regurgitations noted, history of palpitation and dyspnea on exercise, loss of weight, neurasthenia marked by malaise, lack of energy, insomnia, loss of appetite, and pain in the back, regional cephalalgia and clinical or submitted history of opsialgia should be charted. The condition of the eyes with reference to purulent conjunctivitis, the condition of the ears with reference to foruncular or suppurative otitis, the condition of the stomach and bowels, and every clinical evidence which might be in any measure attributed to subacute infection should be noted and charted.

Such history records may be compiled upon printed forms, requiring from thirty minutes to two hours of time, depending upon the case in question.

The following history record of one patient will give you an idea of the procedure:

A Cyst.
B Br. Att.
C Carmichael
D Impacted Tooth
E Slipper Cr.
F Por. Jacket
G Gold Inlay
H Amal. Filling
L Lo. Cr.
M Infection
N Necrosis
O Missing
P Per
R Rich. Cr.
S Shell Cr.
U Pulpless
V Vital
W Fistulus
X Granulum
Y Hypercemen.
Z Canal Filled
Faradic Test
+ Vital
— Devital



Faradic Test 10-11-12—
R. Tonsil Inf. L Inf.
Phar. Inflam.
Adenoid ?
Per. General Gingivitis
Trauma No Hist.
Necro. 10-11-12.
Impacted Tooth —
Granulum ⑩ G$\frac{4}{4}$ > X N. ⑪ G$\frac{4}{4}$ > X N. ⑫ H. $\frac{4}{4}$ < X N.
Fracture-Up — L —
Sinusitus-R. Max. — Hist. L — Hist.
Frontal —Hist. Sphe — Hist. Eth. — Hist.
Transillumination —
Cleft Pal. — Hare Lip —
Sub. Max. Hyper. Sub Ling. —
Cer. Hyper. Ax. Hyper. Thy. < Hyper.
Neoplasm No Age 36 N. Wgt. 125 Wght. 113½

Onset — Unilat. — Bilat. —
Seat —
Growth — Pain — Inf. —
Size — Hered. ♀ Heart - deceased.
Metastasis To Heart. Cachexia <
Anemia — Hemophil. -|-
Chest Sounds Clear
Bowels O. K. Stomach O. K.
Influenza — Pneu —
Malaise -|- Insom. -|-
Psychopathy Neurotic.
Prev. Op. Tonsillectomy.
Arthritis All joints -|- Sciatica — Age 8-9.
Arth. Deformans R. Thumb.
Myositis Trapezius. R and. L.
Systolic 260 Diastolic 130 Pulse P. 130
Neuritis L. Facial? Sciatica — Age 8-9.
Pulse 114 Temp. 99. Resp. 24
Palpitation On exercise Endocarditis -|- Mit. Reg.
Myocarditis -|- Pericarditis -|-
Intermittant — Murmurs <Systolic
Red Cells 4006000 Hemoglobin % 88 White Cell 6300.
Differential Mono 8% < Mono 22% Polys. 72%
Glucosuria — Albuminuria F. Trace.
Color A Reaction Ac. Sp. Gr. 1024.
Microscopal Few pus cells—Few R.B.C., Finely Gran. Casts.
Tuberculosis — Syphilis —
Wassermann Reaction — (Clear).
Bacteriology ⑩ S.V. ⑪ S. and Staph A. ⑫ S.V.
Surg. Path. —
No. Op. necessary | Office — Hosp. -|-
Op. Rm. 10.00 Anes. 10.00 Room @ 4.50
Surg. Diagnosis Inf. Tonsillar Crypts N 10-11-12.
Ex. Cu. 10-11-12.
Resect. 10-11-12 N. Areas. Ex. —
Fee Consult. Fee 10.00 Credit —
Referred M.D. R. M — — — — D.D.S. ——
Name B — — — — Miss F.
Address R — — — — — — — —, Ind.
Phone No. ———— Date 2-18-19'.
Reference Dr. N. W — — — — —, D.D.S.

It is not necessary in all cases for us to make such detailed records, especially those in which we make blood-counts and record other laboratory tests; but when a patient presents for examination, exhibiting a general debiliated condition, and his radiographs present extensive and generalized mouth sepsis or show many pulpless teeth with incomplete canal fillings, we feel justified in making a complete examination.

A series of such records will be of value and will prove interesting in comparison, aside from their worth in aiding us in our diagnoses, advising patients who may need medical or general surgical as well as dental surgical attention, and the assistance they afford in the determination of the course of procedure, the anesthetic of choice and the mode of operation.

It is our custom to have our operated cases report in person or by letter at frequent intervals for the purpose of checking up the possible benefits derived physically by the elimination, surgically, of oral focal infection. In this manner we may determine a logic for future surgical procedure in similar cases.

For the past four months we have invariably made cultural inoculations, incubated, stained and examined microscopically the growths of organisms from the apices of each tooth we extract, both vital and pulpless teeth.

Our routine technic is practically as follows: Every operation is made according to aseptic surgical technic. Immediately upon the extraction of each tooth, without permitting its apex to come into contact with any instrument, the gum or the gauze or drapings, we pick up a direct culture from its apex with a sterile platinum loop, which suspends a loopful of freshly distilled and subsequently boiled water as a vehicle.

This direct culture is planted in culture media—in some cases, blood agar slants, blood agar plates, glucose ascitic agar, or Loeffler's, or bouillon culture. Loeffler's medium is probably the best when we are in doubt about the kind of infection present. Staphylococci will grow upon simple media. Streptococci grow upon blood agar slants or plates. Pneumococci grow upon Loeffler's or blood agar. If a blood agar plate be inoculated and streaked, thereby diluting the direct culture, the individual organisms will colonize to a degree, and we are thereby aided in our studies for differentiation; and the approximate number of colonies, with well-defined zones of hemolysis, may be compared by percentage with all other colonies.

A record of the tooth from which the culture is taken, date of inoculation and kind of media is made, and the culture placed in the incubator. If the tooth be supporting a crown or bridge, or is devitalized and crowned with Logan or Richmond crown, is filled with a post support for the filling, or has been treated by a known routine therapeutic technic, we record this data.

We incubate for from eighteen to twenty-four hours at thirty-seven degrees C. and examine the media for growth. If no growth be present we place in incubator and run for twenty-four hours before re-examination for growth. Examinations of cultures for growth are made daily for five days. If no growth is evident after five days of incubation the culture is considered aerobically negative and is discarded.

From the positive cultures we carefully pick up the individual colonies, mount, fix, stain by Gram method, examine microscopically and record our findings.

In many cases we have inoculated blood agar plates with smears from the apices of pulpless teeth in one field and smears from the apices of teeth with viable pulps in other fields of the same plates. The inoculated fields from pulpless teeth have invariably shown plus growths, and those fields inoculated from the apices of pulp-viable teeth without pulpal exposure by caries and free from extensive periodontoclasial involvement, from the same patient's mouth, have proven negative.

This procedure eliminates the possibilities of error which might result, due to the lack of uniformity, physically and chemically in the culture media. If the media thus inoculated be prepared and contained in Petri plates, it must necessarily have uniform properties for the growth of pathogens.

Therefore a plus growth from a pulpless tooth and a negative growth from a pulp-viable tooth upon different fields of the same plate, can not be attributed to a difference in the properties of the media or time of incubation.

Cultures from the ends of previously-resected tooth roots, in by far the greater percentage of cases, were positive. Therefore, *further and convincing proof* must be forthcoming before we will hazard a favorable prognosis upon the efficiency of root resection as a successful procedure for the elimination of oral focal infection.

This report has not been prepared for the purpose of the condemnation of all pulpless teeth. We instigated these investigations for the purpose of presenting facts, regardless of individual prejudice in the matter. "Facts, not individually-expressed opinions," must become our slogan if we are to become properly classed as scientific, professional, sagacious gentlemen, who are engaged in the practice of a specialty of the healing art called dentistry.

In presenting the results of our bacteriological investigations we will present the case number, tooth, condition, condition of canal, condition of periapical tissues with reference to rarefaction, positive or negative culture, and micro-organisms found.

The results obtained are shown in the following table:

Case No.	Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
Brown—						
1—	1/	L.Cr.	O.K.	Plus	Strep. Gram. Bac.	No X
2—	/1	L.Cr.	1/10	Plus	Staph.	No X.
3—	/2	L.Cr.	1/10	Contam.	B. Sub.	No X.
4—	2/1	L.Cr.	1/2	Plus	Strep. & Vin.	No X Perf.
5—	5/	L.Cr.	1/2	Contam.	B. Sub.	No X.
6—	6/	S.Cr.	1/2	Neg.	———————	No X.
Huston, H.—						
1—	4/	L.Cr.	1/2	Plus	Strep.	(X.
2—	2/	Fill.	3/4	Plus	Strep.	)X.
3—	/4	L.Cr.	4/4	Plus	M. Catarrhalis	)X.
4—	6/	S.Cr.	4/4	Plus	Staph.	No X.

Case No.	Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
Fursco—						
1—	6/	S.Cr.	1/2	Plus	Strep.	No X.
2—	/6	Fill.	1/2	Plus	Staph.	)XX.
Smith, E.—						
1—	2/	Fill.	4/4	Plus	Pneumo.	(X.
2—	5/	Root	O.K.	Plus	Staph.	No X.
Zump, Mrs.—						
1—	8/	S.Cr.	1/4	Plus	Staph.	(XX.
2—	/2	Fill.	Vital	Neg.	———	———
3—	5/	S.Cr.	1/10	Neg.	——— Immediate canal Fill.	
4—	/5	S.Cr.	1/10	Neg.	——— Immediate canal Fill.	
5—	/8	Socket	———	Plus	Staph. Prev. Ex. No Cu.	
6—	/7	Fill.	1/6	Plus.	(M. Catarrhalis-Perf. Max. S. Pneumo.)	
Voisa, Mrs.—						
1—	/7	Fill.	4/4	Plus	M. Catarrhalis Perf. Max. S.	
2—	/2	L.Cr.	1/2	Plus.	Staph.	(X.
Moore, E.—						
1—	1/	L.Cr.	1/4	Plus	Staph.	)X.
2—	/2	L.Cr.	O.K.	Plus	Staph. Root Prev. Resected.	
Hunter—						
1—	/6	Fill.	1/2	Plus	Staph.	)XX.
Shir, Mrs.—						
1—	5/	R.Cr.	1/10	Neg.	———Immed. & Root Fill. No. Inf.	
2—	7/	Socket	———	Plus	Staph.—Not Prev. Curetted.	
3—	8/	S.Cr.	O.K.	Neg.	———Immed. Root Fill. No Inf.	
Howar, J.—						
1—	3/	Fill.	O.K.	Plus	Pneumo. Prev. Resected-Scar T.	
2—	4/	L.Cr.	O.K.	Neg.	———Immed. canal Fill.	
3—	6/	Fill.	1/4	Plus	Staph.	No X.
Stempf, Miss—						
1—	/4	Fill.	Vital	Neg.	———	———
2—	6/	S.Cr.	1/2	Plus	Staph.	)X.
Dougher—						
1—	L.R.2b	Socket-Prev. Ex.		Pos.	Staph.	———
Muelle—						
1—	U.R.1b.	Fill.	1/4	?	Gram B.	(X.
2—	Pus L.	eye	———	Pos.	Staph.	
Chapm—						
1—	U.L.Cent.	Resected	O.K.	Pos.	Pneumo.	No X Resected, 1915
2—	U.R.2dM.	S.Cr.Br.	1/3	Neg.	———	No X.
3—	U.R.1stBi.	Car.	?Vital	Pos.	Strep. Pneumo	No X.
New—						
1—	U.R.Lat.	Fill.	4/4	Pos.	Diphther. Staph.	)Py.)X.
2—	U.R.Lat.	Fill.	4/4	Pos.	Pneumo.	)Py.)X.
Doud—						
1—	U.R.1stB.	Lo.Cr.	4/4	Pos.	Pneumo. Paste canals	)X.
Shaw—						
1—	U.L.Cent.	Fract.	O.K.	Pos.	Pneumo.)X. into nose, Resect.	
Bohn—						
1—	L.R.2dM.	Fill.	1/2	Pos.	Strep.	No X.)Py. X.
Crittenburg—						
1—	U.R.3dM.	Fill.	4/4	Neg.	———	No X.

Case No.	Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
Chapm—						
1—	U.L.2dB.	Resected	O.K.	Pos.	Staph.	No X.
2—	U.L.2dB.	Resected	O.K.	Pos.	Staph.	No X. Blood agar plate.
Miller—						
1—	U.L.2dB.	S.Cr.	4/4	Pos.	Strep. Py. Pneumo.	)X.
2—	L.R.1stM.	Fill.	4/4	Pos.	Strep. Py.	No X.
3—	L.R.1stB.	Fill.	4/4	Pos.	Strep. Py.	)X.
Lucas, C. D.—						
1—	L.R.1stM.	Fill.	1/10	Pos.	Pneumo.	No X.
Great—						
1—	L.R.1stM.	S.Cr.	4/4	Pos.	Pneumo. Staph A.	)XX.
Nickers—						
1—	U.R.Cent.	Root	4/4	?	B. Subtilis (Contam.)	No X.
2—	U.R.Lat.	Root	4/4	Pos.	Staph. Gram-B.	)X.
3—	U.R.Cus.	Root	4/4	Pos.	Staph. Alb.	)X.
4—	U.L.Cent.	Root	4/4	Pos.	Staph. A. Pneumo.	(X.
5—	U.L.Lat.	Root	4/4	?	B. Subtilis (Contam.)	)X.
6—	U.L.1stB.	Root	4/4	Pos.	Staph. A. Vincent's	(X.
7—	U.L.2dB.	Root	4/4	Pos.	Staph. A	(X.
Wilson—						
1—	U.L.1stB.	Fill.	?Vital	Neg.	————	No X.
Gould—						
1—	U.R.1stM.	Fill.	4/4	Neg.	? Properties media	)XXX.
Kimm—						
1—	L.R.1stM.	S.Cr.-Br.	3/4	?	? Properties media.	(X.
2—	L.R.1stBi.	S.Cr.-Br.	?Vital	Neg.	————	No X.
3—	L.L.1stM.	Fill.	M4/4D1/4	Neg.	? Media.	No X.

These last five cases can not be considered. Strep. Py. inoculated on same batch of media from pure culture would not reproduce.

Case No.	Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
Curri—						
1—	U.R.Cent.	Fill.	1/4	Pos.	Staph. A.	No X.
Chapm—						
1—	U.L.Cent.	Lo. Cr.	O.K.	Pos.	Strep. V. Pneumo. Catarrh.	

Root resected 1915. No rarefaction evident.

Case No.	Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
Owe—						
1—	U.L.Cent.	Lo.Cr.	1/10	Pos.	Strepto-bacillus, Pneumo	(X.
2—	U.L.Lat.	Lo.Cr.	1/2	Pos.	Strep. Py. Pneumo. Staph.	)X.
3—	U.L.1stM.	Fill.	4/4	Pos.	Strep. Py. Strep. B. Staph	XXX.
4—	U.L.2dM.	S.Cr.	1/2	Pos.	Short. Strep. Py. Pneumo. Staph.	X.
5—	U.L.Cus.	Fill.	1/10	Pos.	Staph.	)X.
6—	U.R.Lat.	Lo.Cr.	O.K.	Pos.	Staph.	(X.
7—	U.R.Cent.	Lo.Cr.	4/4	Contam.	B. Subtilis.	(X.
Bretzm—						
1—	U.R.Cent.	Lo.Cr.	O.K.	Neg.	————	No X.
2—	U.R.Lat.	Lo.Cr.	1/10	Neg.	————	No X.
3—	U.R.Cus.	Lo.Cr.	1/4	Neg.	———— ? Perf. Dist.	No X.
4—	U.R.1stBi.	R.Cr.	1/2	Pos.	Strep. Py. Staph. Br. Att.	(X.
5—	U.R.2dM.	Rt.	4/4	Pos.	Staph. A. Pneumo. Buried	No X.
6—	U.R.1stM.	S.Cr.	1/2	Pos.	Staph. A.	No X.
7—	U.R.3dM.	S.Cr.	?Vital	Pos.	Strep. V. Staph. A.	No X.
8—	U.L.Cent.	Lo.Cr.	1/10	Pos.	Gram. B.	)X.
9—	U.L.Lat.	Lo.Cr.	1/2	Pos.	M. Catarrhalis	(X.
10—	U.L.Cus.	Lo.Cr.	O.K.	Pos.	Strep. Py. Staph. A.	No X.

Case No. Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
11—U.L.1stBi.	Lo.Cr.	1/2	Pos.	Gram. B. M. Catarrhalis	(X.
12—U.L.2dBi.	R.Cr.	1/2	Pos.	Strep. V. Staph. A.	)X.
13—U.L.1stM.	S.Cr.	4/4	Pos.	Strep. Py. Pneumo.	No X.
14—U.L.2dM.	Fill.	4/4	Pos.	Strep. Py. Staph. A.	No X.
15—U.L.3dM.	Fill.	Vital.	Pos.	Staph. A. (Deep Py. Pocket Mes).	
The last fifteen case reports were cultured upon blood agar plates.					
Curri—					
1—U.R.Cent.	Fill.	O.K.	Pos.	Staph. A.	)X.
2—U.R.Lat.	Vital	Vital	Neg.	———	No X.
3—U.R.Cus.	Fill.	4/4	Pos.	Strep. Py. Staph. A.	No X.
4—U.R.1stB.	Socket	———	Neg.	———	———
5—U.R.2dBi.	Socket	———	Neg.	———	———
6—U.R.1stM.	Socket	———	Pos.	Staph. A. Pneumo.	———
7—U.L.Cus.	Lo.Cr.	1/10	Pos.	Staph. A.	No X.
8—U.L.1stBi.	Socket	———	Neg.	———	———
9—U.L.2dBi.	Socket	———	Pos.	Strep. Py.	———
10—U.L.1stM.	Fill.	Vital	Neg.	———	No X.
The last ten cases were cultured upon blood-agar plates.					
Boz—					
1—L.R.1stM.	Fill.	4/4	Pos.	Strep. (Paste in canals)	No X.
Johnson, G.—					
1—U.L.2dBi.	———	Vital	Pos.	Strep. Staph. (Deep Py. Pocket)	
Young—					
1—U.L.2dM.	S.Cr.	1/2	Pos.	Strep. (Acute abscess)	No X.
2—L.R.Cus.	Inlay	1/2	Pos.	Strep. Staph.	No X.
Berryh—					
1—U.R.2dBi.	Socket	———	Neg.	———	———
2—U.L.Cus.	Socket	———	Pos.	Strep.	———
Liese.					
1—U.R.Cus.	R.Cr.	4/4	Neg.	———	)X.
2—U.L.1stBi.	R.Cr.	4/4	Pos.	Strep. Staph.	)X.
3—U.R.2dBi.	R.Cr.	4/4	Pos.	Strep. Staph.	)X.
4—U.R.Lat.	Socket	———	Pos.	Diphtheroid.	———
Mayer—					
1—L.R.1stM.	S.Cr.	1/2	Neg.	———	No X.
McDerm—					
1—L.R.1stM.	Fill.	1/2	Pos.	Staph. A.	No X.
2—U.R.1stM.	Pyor.	Vital	Pos.	Strep. Py. (Deep Py. Pocket)	
3—U.R.2dM.	Pyor.	Vital	Pos.	Staph. A. (Deep Py. Pocket)	
Dryer—					
1—L.R.2dBi.	Pyor.	Vital	Pos.	Staph. A. (Deep Py. Pocket)	
2—L.R.1stBi.	Pyor.	?Vitality	Pos.	Strep. Staph. Dip.	(X.
Bernos—					
1—U.L.1stM.	Fill.	1/2	Pos.	Strep. Vincents.	(X.
2—L.R.1stM.	Fill.	4/4	Pos.	Staph. A.	)X.
Williams, E. A.—					
1—U.R.1stBi.	S.Cr.	4/4	Pos.	Staph. A.	)X.
2—U.L.2dBi.	S.Cr.	1/6	Neg.	——— (Pyor. Dist.)	(X.
3—U.L.1stM.	Fill.	Vital	Neg.	———	No X.
Parry—					
1—U.L.Cus.	Root	O.K.	Pos.	Strep.	(X.
2—U.L.1stM.	S.Cr.	1/2	Pos.	Dipth. Staph. (M-B Root Resect)	

Case No. Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
Dowd—					
1—U.R.1stBi.	Lo.Cr.	1/4	Pos.	Pneumo.	)X.
Nichol—					
1—U.L.Lat.	Fill.	O.K.	Pos.	Gram. B. Pneumo. Dipth.	No X.
2—L.R.2dM.	S.Cr.	1/10	Pos.	Strep. Staph. Pneumo.	(X.
3—L.R.2dBi.	R.Cr.	1/10	Pos.	Pneumo. Dipth.	No X.
Stemp—					
1—L.R.2dBi.	Inlay	4/4	Pos.	Strep. V. (Canal filled paste)	)X.
2—L.R.1stM.	Fill.	4/4	Pos.	Dipth. Gram. B.	
Frawl—					
1—L.R.3dM.	Fill.	4/4	Pos.	Staph.	(X.
Stemp—					
3—L.L.2dM.	Fill.	4/4	Pos.	Strep. Pneumo.	
Maff—					
1—L.L.1stM.	Fill.	O.K.	Pos.	Staph. A.	No X.
Morgendo—					
1—U.R.Cent.	Lo.Cr.	1/4	Pos.	Gram. B.	No X.
2—L.L.1stM.	S.Cr.	3/4	Pos.	Dipth.	(XX.
3—L.L.2dBi.	Fill.	1/6	Neg.	———	No X.
4—U.L.Cent.	Lo.Cr.	1/4	Pos.	Strep. V.	)X.
5—U.R.1stM.	Fill.	4/4	Pos.	Staph. (Pyor. Dist.)	(X.
Avery—					
1—U.L.Lat.	Fill.	1/2	Pos.	Dipth. Vincent's	(X.
2—U.L.1stBi.	Fill.	1/2	Pos.	Staph. A.	(X.
Howard—					
1—L.R.Cus.	Resected	O.K.	Pos.	Strep. V. Gram. B. (Res'td) F. Tiss.	
Houston, Mrs.—					
1—L.R.1stBi.	Fill.	4/4	Pos.	Staph. A.	No X.
2—L.R.2dBi.	S.Cr.	4/4	Contam.	B. Subtilis.	No X.
Layde—					
1—U.R.1stM.	Fill.	1/2	Pos.	Staph. A.	No X.
Hart—					
1—L.R.3dM.	Fill.	1/2	Pos.	Staph.	No X.
Kibler, W. D.—					
1—L.R.1stM.	Socket	———	Pos.	Strep. V. (Extd. 6 yrs. ago)	
2—L.L.1stM.	Treat.	Treat.	Pos.	Strep. Staph.	No X.
Bohn, Mr.—					
1—L.R.2dM.	Fill.	1/2	Pos.	Staph. (Pyor.)	No X.
Monsuir—					
1—L.R.1stM.	Fill.	4/4	Pos.	Strep. Dipth. (Pyor.)	No X.
Maxwell—					
1—Trench mouth				Vincent's, Staph.	
Howard—					
1—L.R.Lat.	R.Cr.	O.K.	Pos.	Staph. A.	No X.
2—L.L.Lat.	R.Cr.	O.K.	Neg.	———Zimmed. canal Fill.)	No X.
Wheeler—					
1—L.R.2dM.	Py., loose	4/4	Pos.	Gram. B. Strep. B. Vincents	No X.
Hollwe—					
1—L.R.2dM.	Fill.	1/10	Pos.	Strep. V. Pneumo, Straph.	(X.
2—U.R.2dBi.	Jack. Cr.	1/4	Contam.	B. Subtilis	)X.
3—U.L.1stM.	S.Cr.	1/10	Pos.	Strep. V. Pneumo. (Very Large)	X.
4—L.R.1stM.	S.Cr.	1/10	Pos.	Strep. V. Pneumo. (Very large)	X.

Case No. Tooth	Condition	Canals	Culture	Organisms.	Granulum X.
Teagard—					
1—L.R.2dBi.	Fill.	4/4	Pos.	Strep. Staph.	)X.
2—U.L.1stBi.	Inlay	1/3	Pos.	Staph. A.	(X.
3—L.L.3dM.	Fill.	1/4	Pos.	Pneumo.	No X.
4—L.R.3dM.	Fill.	4/4-1/10	Pos.	Strep. Staph.	No X.
Nihma—					
1—Trench mouth				Vincents. Strep.	
Hart—					
1—U.R.Cent.	Slip.Cr.	4/4	V-Contam.	B. Subtilis.	No X.
2—U.L.Lat.	Lo.Cr.	O.K.	Pos.	Strep. (Canal Fll. Thro. Apex)	
3—U.L.2dM.	S.Cr.	4/4	Contam.	B. Subtilis.	)X.
4—L.L.2dBi.	Fill.	4/4	Pos.	Staph. (Plus to Far.)	No X.
Booze—					
1—U.L.Lat.	Lo.Cr.	1/10	Contam.	B. Subtilis	No X.
Sin Clai—					
1—U.R.2dBi.	Lo. Cr.	4/4	Neg.	———	(X.
2—U.R.1stM.	Fill.	1/2	Pos.	Staph. A.	)X.
3—L.L.1stM.	Fill.	1/2	Pos.	Gram. B.	)X.
Beverid—					
1—U.L.Cent.	Root.	4/4	Neg.	———	No X.
2—U.R.Cent.	Vital.	———	Pos.	Pneumo. (Extensive Py.)	No X.
3—U.R.Lat.	Root.	4/4	Pos.	Pneumo.	(X.
4—L.L.1stBi.	Root.	4/4	Neg.	———	No X.
5—L.R.1stBi.	Vital	———	Neg.	———	No X.
6—U.L.Cus.	Root.	4/4	Pos.	Staph.	(X.
7—U.R.2dM.	S.Cr.	4/4	Pos.	Vincents. (Deep Py. Pocket)	No X.
Fitto—					
1—L.R.1stM.	Fill.	4/4	Pos.	Staph. A. (Very Large)	X.
Garlan—					
1—U.R.Cent.	Vital	———	Neg.	——— (Pyor.)	No X.
2—U.L.2dBi.	Fill.	4/4	Pos.	Strep. V. (Broach)	)X.
3—U.L.Lat.	Lo.Cr.	1/3	Pos.	Staph.	No X.
4—U.L.1stM.	S.Cr.	4/4	Pos.	Gram. B.	No X.
Maxwe—					
1—U.L.1stM.	Fill.	1/2	Pos.	Pneumo.	No X.
2—U.R.1stM.	Fill.	4/4	Pos.	Staph. A.	)X.

ABBREVIATIONS

Fractional notations represent apical portions unfilled.
S.Cr.—Shell crown.
R.Cr.—Richmond crown.
Slip.Cr.—Slipper crown.
In.—Inlay.
Fill.—Filling; amalgam or gold.
Py.—Pyorrhea or periodontoclasia.
)X.—Large granulum.
(X.—Small granulum.
O.K.—Canals completely filled.
Vital—Vital pulp.

We are undecided as to whether the Gram bacillus is the bacillus prodigiosus or otherwise. In pure culture it ferments dextrose and does not ferment lactose or maltose. We are of the opinion that it is a non-pathogen.

Organisms identified are as follows:

	Times found		Times found
Streptococcus viridans	11	Pneumococcus	30-
Streptococcus pyogenes	37	Micrococcus catarrhalis	6
Staphylococcus Albus	78	Strepto bacillus	5
Diphtheroid bacilli	10	Bacillus subtilis (Contam.)	9
Gram. Bacilli	11	Negative cultures	26
Vincent's organisms	8	Cultures inoculated	181
Streptococcus hemolyticus	? 4%	Cultures from granulomata	71

Considering the patient's clinical pictures before the surgical removal of pulpless teeth and their subsequent physical improvement after the removal of such teeth, plus bacteriological findings in the individual cases, we are convinced that, generally speaking, pulpless teeth should be considered, in at least ninety per cent. of cases, a menace to human health and happiness.

DISCUSSION

Dr. Earl Brooks, Noblesville: I want to express my pleasure at having heard Dr. Lucas' excellent paper. Especially I want to commend him for the excellency of nomenclature and thoroughness of physical examination in arriving at conclusions concerning dental surgical diagnosis. He might well have added that feature to his subject, inasmuch as his paper covers that subject as thoroughly as it does the bacterological side of the question.

The routine examination of a patient presenting for oral surgical diagnosis as outlined by Dr. Lucas is the "last word" on the subject, yet I am free to express myself that in the greater majority of cases, it does not need to be so elaborate as outlined; yet the dentist that poses as capable of advising should be prepared, both in knowledge and equipment, intelligently and scientifically to make such a diagnosis. For the man who is not inclined to do this, he should demand it of the internist, and then he should be prepared to understand the importance of his report as well as the laboratory reports. This will mean a clear understanding of many points in physical diagnosis. I should like to recommend a text-book that should be on the desk of every dentist who ever attempts this work—"Physical Diagnosis," by Cabot, published by Wm. Wood & Co.

It is not always necessary that every dentist be equipped to make the various laboratory tests; yet they are not so difficult as one might imagine. If he is mentally equipped to weigh their importance, he is capable of making them.

One point that Dr. Lucas does not mention that I think should be carefully watched for in interpreting X-ray shadows is, the condensing shadows in the periapical tissues of pulpless teeth. These are quite as important as rarefactions. Nature makes many attempts to repair the rarefied areas, and this results in a condensed osseous tissue. Without having this condition in mind one is liable to pass over an area thinking that it does not show pathology. Bacteriological examination of this tissue usually will grow cultures as rich in flora as from a granulomata.

The negative growth from pulp-viable teeth is only what we would naturally expect. The plus growth from pulpless teeth we might think high; yet if one will but study the results of various investigations, he must be convinced of the correctness of the same. Personally, I have made cultures from fifty cases of the apical third of pulp canals of filled roots and secured ninety per cent. cultures. The ten per cent. negative cases I attributed to hermetically sealed apices. This test convinced me that pulpless teeth must be reckoned with as dangerous to the patient, especially when the resistance of the patient is low.

In the light of these and other similar investigations, the question arises as to when should we extract and when should we conserve pulpless teeth? When the physical diagnosis reveals the fact that the patient is not suffering any visible effects of foci of infection, the resistance is normal, and the radiograph reveals no pathology, it is my practice to advise the retention of such teeth, especially so when reconstruction presents difficulties. I am not an applicant as yet for the "One Hundred per cent. Vitality Club," but will confess I sometimes feel kindly towards their code of ethics.

I will report one case that illustrates the above principles: This case presented last Friday for diagnosis. Time did not permit of a complete report, but I have sufficient to illustrate the principle. Patient, male, age 27. Blood pressure, heart, pulse, temperature and respiration normal. Sinusitis, no history. Tonsils, normal. Seven years ago patient had urethritis, and at the same time developed articular rheumatism of right knee. Both conditions yielded to treatemnt. No symptoms manifested from that time until about four months ago when the articular rheumatism reappeared in the same knee, also the great toe on the right foot became enlarged, red and painful. Iritis developed about a month ago. Foci were suspected in the urethra or prostrate but the gland is not tender to massage. A gonorrheal vaccine was injected to excite the flora if present, but cultures from both anterior and posterior urethra proved negative. Urine examination proved normal, with no mucous shreds. With this history the patient was sent to me for dental diagnosis. No artificial crowns present. Slight gingivitis in two interproximal spaces. All teeth present and all vital with the exception of the following six which I personally devitalized.

Upper right first molar, 1907; devitalized with arsenic. Canals filled with pustolene and gutta-percha points. Lingual canal one hundred per cent. filled, buccal canals ten per cent. filled. Radiograph indicates no pathology.

Lower left first molar, 1907; devitalized with arsenic, canals filled with pustolene and gutta-percha points. Radiograph shows only the paste to the end of the mesial canals, nothing in the distal canal. Some rarefaction around apex of distal root.

Upper right second bicuspid, 1912, devitalized by pressure anesthesia and canals immediately filled with chloro-percha and gutta-percha points. Canal fifty per cent. filled. Radiograph indicates no pathology.

Upper right cuspid, 1917; devitalized by pressure anesthesia and root canals filled immediately with chloro-percha and gutta-percha points. Canals ninety-five per cent. filled. Radiography indicates no pathology.

Upper left first bicuspid, 1917; devitalized by pressure anesthesia and root canals immediately filled with chloro-percha and gutta-percha points. Canals ninety-five per cent. filled. Radiograph indicates no pathology.

Upper left second bicuspid, 1917; devitalized by pressure anesthesia, canals filled immediately with chloro-percha and gutta-percha points. Canals ninety-five per cent. filled. Radiograph indicates no pathology.

I have already asked that a Wassermann test be made and also that a blood-count be taken; however, I expect to remove the lower left first molar with its related pathological tissue. I can see no reason for the M.D. passing the buck to me any further than this. Some or all of those remaining teeth may be the foci, but I have no reason to believe they are as much a menace as a hidden gonorrheal infection, even if it cannot be definitely located there now. Although, as Dr. Lucas has shown and proven, these pulpless teeth no doubt harbor infection; but remember that bacteria possess virulency of different degrees and certainly in cases of this character the virulency must by low. I reported this case to illustrate the value of the clinical history in making your final dental surgical diagnosis.

Dr. C. A. Nixon, Valparaiso: I don't know how the rest of you feel after having listened to this splendid paper; but I hope I may convey the real, true sentiment of admiration, and express my gratitude to the essayist, for the most admirable and intelligent manner in which he has presented this subject.

I want to extend to Dr. Lucas individually, my personal thanks and appreciation of his work, and say that the I. S. D. A. may hold her head high with pride to have him, a native son, in her ranks, competent to cope with the best of them.

"Facts, not individually expressed opinions" are what we want, and what we have; and it is through such men as Dr. Lucas that we get these. We should be content then to accept the teachings and educate ourselves to follow them and not attempt, on individual opinions, to criticise or form doubts.

Surely, no one will or can doubt the unmistakable proof which has been given. Pathological science in the modern way is founded upon the scientific study of bacteria. The influence of mouth bacteria upon the body is so overwhelming that it is impossible to comprehend, without a comprehension of their characteristics and actions. Medical and dental science must be based upon their study, and carefully-selected cultures and growths prepared.

The scientific manner in which they have been prepared should furnish sufficient proof from which we should get an inspiration and a glimpse of the wonderful task that lies before us.

I am inclined to believe that the resentment with which some members of our profession have met and are meeting reports on focal infection, the result of bacterial invasion, is based upon opinions which grow out of procedures that will not stand investigation when science begins her research, and not facts.

Evidently from the proof that has been given us, it would be possible, that distant foci of infection may be established and may become self-supporting from bacteria housed up in pulpless teeth; and the individual who persists in their retention loses sight of the foregoing fact and demands the one hundred per cent. result from the other. What medical man or surgeon can produce such results?

If as much time were spent in trying to preserve vitality of tooth pulp and improve the healthful condition of tissue surrounding the same, as is spent in the opposite direction, humanity could not help but benefit twofold therefrom.

In formulating Dr. Lucas' conclusion based upon facts, I personally am convinced from positive experience, personal and otherwise, that his findings, so scientifically pursued, are right.

Our competent essayist has left nothing to discuss; he has proven everything step by step, presented facts, not "individually expressed opinions," so it is for us either to agree or disagree, and I believe that it does not behoove any of us to take issue unless we have, from a scientific procedure equally as accurate, proven our argument and put the cards on the table, face up as has Dr. Lucas.

Keep up the good work Dr. Lucas. It is worth while and the rapidly-filling ranks of co-workers will be your reward. We are proud of you.

Dr. Boice, Tuscola, Illinois: For the past month I have been down and out with neuritis. I woke up one morning with my head drawn to one side. That was the third attack of neuritis I had suffered in about three years. I had an X-ray taken, and found a number of devitalized teeth, all of them with areas above them, and there was one impacted third molar. I was advised to take them out, but I held onto them for a while.

I came here to Dr. Lucas, and he operated on me last Saturday morning. Sunday morning when I awoke I could lay my head flat on the pillow, and could put my right arm anywhere I wanted to without pain, and I haven't had a severe neuritic pain since then. I feel the surgical cleaning up of my mouth has cleared up the neuritis.

Dr. Lucas (Closing): Dr. Brooks made a very good point when he mentioned the osteoschlerotic areas around the ends of pulpless teeth, mentioning the fact that you get positive cultures from those areas. But in this series of cases which I undertook, my work was limited to the periapical organic tissues only, and not to the condition of the bone. I did make some cultures, however, from curettage of osteoschlerotic areas at the ends of pulpless teeth, and those cultures were invariably positive. Later I hope to carry this work further, and make my cultures, get my growths and inoculate animals, post the animals, tabulating the results upon the different tissues and organs of the animals inoculated from tooth infection. I expect to report this series at some future time, but it will take a year or two to work it out.

I also expect to inoculate these animals intervenously with the organisms found in the sub-periapical tissues, or the organisms generated or grown from the osteoschlerotic areas on cultures.

The matter of condensing shadows around the apices of pulpless teeth is very significant, and in all cases where we have made inoculations from that kind of bone, we have grown positive cultures.

Some dentists are advocating the idea of the retention of pulpless teeth in the patient's mouth, when the patient is found not to be suffering from systemic sequelæ which may be due to subacute infection, or infection from micro-organisms which are attenuated by the body immunity fluids of the patient. They are advocating the retention of those teeth when no sequelæ are present at the time of examination, and later, if the patient develops some systemic sequelæ, they advise taking these teeth out.

My personal experience is this: After hearing papers in Chicago recently, in which only radiographic evidence was presented as absolute data, I had my only pulpless tooth removed. Following this extraction and curettment something cured the arthritis in my finger joints. Two days from the time the tooth was surgically removed and the socket curetted I had none of the pain in my finger joints which I was having before the operation. The culture from that tooth was made by Dr. Ricard, of Ann Arbor, the tooth was extracted by a specialist who operates under surgical technic, the culture grew pneumococci. They were plated, streaked, and we got a pure culture of pneumococcus from the end of the tooth. I have consulted bacteriologists about the results patients suffer from pneumococcal infection at the ends of roots of teeth. They tell me the patient suffers about the same conditions such as arthiritis and soforth from pneumococci at the ends of teeth as from streptococcal infection. I am very much pleased to think that I am one hundred per cent. tooth vital because I feel better physically.

I said something about an experimental case of root resection, and this is how I did it: The tooth was treated with phenol, the first treatment, to sterilize the canal if possible, then by Ricard's method of applying ammoniacal silver oxid, pumping the dry canal full of a solution of ammoniacal silver oxid. A saturated solution of nitrate of silver is dropped into a test tube containing two cc. of ammonium hydroxid, drop by drop, until there is a beginning of formation of a flocculent precipitate, not carrying it like Howe, until he precipitates all of the silver nitrate. That solution is pumped into the canal, and the silver is precipitated, having a solution with the silver still active, in the canal, then the silver is precipitated out of the solution by adding eugenol. The canal is dried, the ammoniacal silver nitrate again applied, and again precipitated. We have a silver salt in an active form instead of an inactive form, and it will no doubt have some sterilizing effect upon the canal. Then we have the metallic silver precipitated with the eugenol. The canals are filled by the Callahan method. The tooth in question was then resected to the point where it was supported by viable fibers, all the granuloma and the bone around the granuloma removed, and the tooth end was made dry by packing, first using adrenalin chlorid to stop the hemorrhage, the ammoniacal silver oxid applied upon the resected end, precipitated with eugenol, dried out, applied again, precipitated, then the flap brought down and sutured to place, leaving a vent for irrigation. The wound was irrigated until there was no opening into the crypt.

They report at Ann Arbor that this method is a success. I am not convinced, but I am going to try it, and later am going to make cultures from that root end. I will not be convinced by radiographic interpretation of conditions at the ends of pulpless teeth. Bacteriological evidence is the only conclusive evidence.

Dr. Nixon emphasized the importance of bacteriological investigation of periapical tissues for arriving at a logical conclusion as to the pathogenic condition which exists at the ends of these roots. It is the bacteria and their by-products from which we must relieve our patients, and the only way to arrive at a definite conclusion as to the pathological condition at the ends of pulpless teeth is by bacteriological technic.

DENTISTS IN HOSPITALS, PUBLIC CLINICS AND MEDICAL COLLEGES

BY H. L. AMBLER, M.S., D.D.S., M.D., CLEVELAND, OHIO

(Written for THE DENTAL SUMMARY)

IN THIS SHORT and incomplete historical article, the writer will prove to dentists, physicians, surgeons and laymen who are not familiar with the facts, that for a great many years dentists have been professionally connected with hospital and medical college staffs, and also have operated in free public clinics, because he believes that the majority are not conversant with the facts, but they think that the connection of dentists with the above work (institutions) is of recent origin.

Beginning in 1863, N. H. Ambler, D.D.S., served for several years at the Ohio State Hospital at Newburgh, Ohio (now Cleveland).

In 1900, the city authorities of Philadelphia Hospital added four dentists to the staff.

In 1901, H. M. Clapp, graduate of W. R. U., was appointed dentist at the Utica N. Y. State Hospital, the House of the Good Shepherd, and Utica Orphan Asylum. He received fees such as he would in his office, and at the Asylum an office has been fitted up by the management.

In 1902, at the Philadelphia Hospital, dentists were appointed on equal terms with M. D.'s.

In 1903, J. W. Culver, D.D.S., was a member of the medical staff of the Ohio Hospital for Epileptics, at Gallipolis, Ohio.

In 1904, Dr. H. B. Rosenwasser was appointed dentist to the Cleveland Jewish Orphan Asylum, where he has a room with the necessary dental appliances. The kinds of operations performed are the same as in his regular office.

In 1905, J. Rosensteel began practice at the State Hospital in Cleveland, and continued for two years, when E. M. Herrick was appointed resident dentist with the rank of assistant physician.

In 1908, H. R. Cooley, director of charities, appointed H. E. Moffett dentist to the Cleveland Boy's Home at Hudson, Ohio, where he spent one day per week. The city furnished the office and materials, and paid him a salary.

In 1908, C. K. Teter, D.D.S., was appointed chief anesthetist at St. Luke's and Lakeside Hospitals, and in 1910 established plants at both places for the manufacture of NO_2.

Before 1909, H. M. Semans was appointed dentist to the Protestant Hospital, Columbus, Ohio.

About 1909, E. S. Stevens was dentist at the Metropolitan Hospital, N. Y. city; he is classed as a specialist; Dr. J. E. Ambler, laryngologist.

Dr. A. J. Flanagan, Springfield, Mass., was dentist at charitable institutions for seven years, and on the hospital staff for twelve years.

In 1910, Mrs. C. S. Chandler, a member of the Board of Onondaga N. Y. Orphan Asylum, presented the institution a dental chair and appliances which belonged to her late husband. Several dentists will contribute of their time to care for the children's teeth.

The dentists of Elizabeth, N. J., asked dental manufacturers to donate instruments, etc., to be used in a free clinic at the General Hospital.

Dr. H. L. Wheeler: September 23, 1910

The trustees have, upon the recommendation of the Medical Board, resolved to appoint a dental interne at Bellevue Hospital as suggested by you. Will you recommend a competent dentist, and advise us what steps are necessary on our part to get the place established?

Very truly,
F. K. PAULDING, *Sec. Board of Trustees.*

International Medical Mission Institute, Chicago, S. A. Wilson, B.S., D.D.S.

Free dental infirmary established at St. Anthony Hospital, Rockford, Ill., by the Odontological Society.

St. Luke's Hospital, Chicago, J. S. Marshall and Thos. Gilmer, dentists.

Chicago Orphan Asylum, J. B. Deolin, dentist.

Home for Destitute Crippled Children, Chicago, J. S. Marshall and E. S. Talbot, dentists.

Presbyterian Hospital of the City of Chicago, T. W. Brophy, dentist.

Provident Hospital, Chicago, T. W. Brophy and C. E. Bentley, dental surgeons.

In 1911, J. R. Teed, of Verona, N. J., was appointed dental surgeon at Essex County Hospital for the Insane at Overlook, by the committee of the Board of Freeholders. Salary, ten dollars per week.

In 1913, J. P. Henahan was appointed dental surgeon at Lakeside Hospital, Cleveland, and served for two years, during which time he was also a member of the faculty of W. R. U. Medical Department.

At Sacramento, March 16, 1918, Senator Willis informed his colleagues during a debate on his bill creating the office of State Dental Surgeon that "twenty-five per cent. of insanity is caused by defective teeth," The bill which was passed, provides two hundred dollars a month for a dentist whose duty it shall be to treat the inmates of hospitals for the insane.

H. Herbert Johnson is a member of the Hospital Association Staff, Macon, Ga.

In 1897, Dr. W. H. Potter, of Boston instituted free dental clinics for the poor at their homes, where only extracting and toothache was attended to.

In 1897, the Cleveland City Dental Society appointed Drs. G. H. Wilson, W. A. Price and W. G. Ebersole, as a committee on Dental Instruction in the public schools, and after consultation with Superintendent Jones, they prepared a card of valuable instructions on the nature, use and care of the teeth, which was given by the teachers to the pupils, thus doing some good. Another item accomplished, was a slight betterment of the chapter on the teeth in the school physiology.

In 1900, the National Dental Association appointed a committee to consider the expendiency of taking steps towards the cooperation of the public schools in teaching Good Teeth—Good Health.

In 1904, H. L. Ambler presented a paper on Care of the Teeth of the Poor, before the International Dental Congress at St. Louis, in which he said in part: In order that the greatest benefit may be derived from dental hygiene, it should be demonstrated by trained teachers or dentists who should exhibit tooth brushes and show how to use them, also show proper toothpicks and silk floss for cleansing proximal surfaces. The most simple dentifrices, both liquid and solid should be mentioned, with the method and frequency of using them. Mouths of children in public schools should be examined by dentists; carious and diseased teeth filled or extracted, and instructions given and enforced for care of the teeth. We must reach the parent through the child, the child through the teacher, and the teacher through a dentist paid by the municipality, as the text-books are sadly lacking.

Before the above date the city of Strassbourg resolved to spend eight thousand dollars for a dental hospital, where every child must be examined before entering school. and twice yearly until they were thirteen years of age. In Paris, the municipal council decreed that pupils in the public schools must have their teeth examined every six months;

some of the children obtained free service at the dental college. See *Cosmos*, March, 1905, for complete paper.

In 1906, the Cleveland Dental Society in connection with the director of charities, established a Municipal Dental Clinic in the City Hospital and equipped it for simple operative dentistry. Dr. Acker volunteered one-half day per week, and the members of the dental society subscribed enough to pay him for a second half-day per week; this clinic was continued for about eighteen months.

Drs. W. G. Ebersole, J. R. Owens, W. A. Price, the committee on Oral Hygiene, of the Cleveland Dental Society, obtained permission to examine the teeth of children in four schools This was done by members of the society, June 14, 1909, and later permission was given to examine the teeth of all public school children and maintain during 1910, four clinics for free care of teeth of needy ones. The examination was made and clinics established; the school board furnishing only rooms, heat and water. After the clinics had been in operation for some time, to the special class (40) at Marion school was given a mental examination and it was shown that they had made an increase in efficiency of 37.44 per cent. Dr. Frank Acker was director and Dr. H. R. C. Wilson secretary of the clinics, which were discontinued in December, 1910, but more *extensive* ones have succeeded them and are now in operation.

Dental dealers, manufacturers, and the State Society contributed some money or supplies, or loaned some equipment, and members of the Cleveland Society contributed to a fund which enabled them to provide for clinicians and incidental expenses during the year. The Oral Hygiene campaign officially opened in Cleveland, March 18, 1910; for particulars see DENTAL SUMMARY, February, March, June, 1910. The writer thinks that the public schools in Brooklyn, N. Y., were among the first to be inspected in this country.

The dentists of Greenwich, Conn., (about 1910) agreed to charge the poor and needy children who are recommended by the United Workers, only ten cents for each tooth operated upon.

In 1825, H. H. Hayden, a Baltimore dentist, delivered to medical students at the University of Md., lectures on dental physiology and pathology.

In 1864, Washington University, St. Louis, appointed a dentist on the medical faculty.

In 1868, H. L. Ambler was on the faculty of the Homeopathic College in Cleveland; he served six years.

In 1874, L. Buffett, D.D.S., was appointed professor of Oral Surgery and Dental Pathology, Medical Department W. R. U., Cleveland; he served for seven years.

In 1876, J. R. Bell was a member of the Faculty of the Homeopathic College in Cleveland; he served nine years.

In 1920, seventy-five thousand dental operations performed during ten years is the record of the Cleveland Mouth Hygiene Association. Hygiene stations are now being operated by the schools: free stations are operated by the association from funds furnished by the Community Chest. The film, "Come Clean" has been used extensively for dental propaganda.

B. Holly Smith, professor of Principles and Practice of Dental Surgery as applied to medicine, was a member of the faculty of Physicians and Surgeons College, Baltimore.

Elizabeth Richardson, lecturer on the Care and Preservation of Children's Teeth, College of Physicians and Surgeons of San Francisco.

Emma L. Benham, D.D.S., M.D., professor of Dental Pathology and Surgery, Harvey Medical College and Playfair School of Midwifery, Chicago.

T. W. Brophy, professor of Dental Pathology and Surgery, Rush Medical College, Chicago.

A. W. Harlan (deceased) was professor of Dental Surgery at College of Physicians and Surgeons, Chicago; T. A. Broadbent, adjunct professor of Dental Surgery and A. E. Miller clinical instructor.

E. S. Talbot, professor of Dental Surgery, Northwestern University, Woman's Medical College, Chicago.

Charles E. Bentley, professor of Dental Surgery and Pathology, Harvard Medical College, Chicago.

E. S. Reed, professor of Dental Surgery, National Homeopathic Medical College, Chicago.

F. H. Gardiner, professor of Dental Surgery, Chicago Homeopathic Medical College.

F. H. Stafford, lecturer on Dental Surgery, Chicago Physiomedical College.

J. D. Robertson, professor of Dental Surgery and Pathology, Dunham Medical College, Chicago.

In 1904, there were twenty (perhaps more) dentists as members of medical faculties.

In 1904, the National Dental Association, resolved: That every state should insist that every medical college within its bounds should attach to its teaching staff a lecturer on oral hygiene, dental pathology and prophylaxis.

428 Rose Building.

PRESIDENT'S ADDRESS*

BY J. L. AUSTIN, D.D.S., CHATTANOOGA, TENN.

AS I STAND before you today thinking of the progress that has been made in dentistry in the last fifty years, I see a little group of dentists called together fifty-two years ago for the organization of the Tennessee State Dental Association. This organization has steadily grown from this small nucleus to one of the livest and best state associations in the entire South; and within the last few years our membership has shown a steady increase.

The Tennessee State Dental Association has had from the time of its organization some of the very best men to be found in the country. Here we pause for a moment and think of our much beloved and grand old man, Dr. Henry W. Morgan, a man who missed so few state meetings in all his useful career, and at our last meeting, while he was deprived of being present on account of sickness, sent us a telegram of "greetings." While he has crossed the River, yet he leaves an influence that will live for generations and a memory in our hearts which will be forever green. From the lives of older men who have gone before us, we learn many great and true lessons. That which makes a man great and beloved in any community or any group, is the devotion and sincerity with which he enters into his work. We are all endowed by the Great Maker with certain talents, and it is our duty to use these talents and multiply them and not bury them like the foolish servant. In the life of Dr. Morgan we see an example of the man who used his talents and multiplied them, an example of a man who devoted his time, his life, his all to the uplift and the advancement of the dental profession. And I am sure that every man within the sound of my voice gets from the example of Dr. Morgan an inspiration of ambition and of service.

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*Read before the Tennessee State Dental Society, May, 1920.

This association has been a great clearing house in the past few years, by which we have been able to better meet the obligations as they confronted us on the relationship of oral foci to general systemic conditions, and to establish us in our rightful place along with the medical profession, hand in hand in the cure of many diseases and the prevention of many more. It is our duty to know and recognize oral foci of infection. In the World War which has just ended, the importance of our great profession has been made more manifest than ever before. We have seen how the mental and physical qualifications of our soldiers have been impaired and lowered by focal infection and dental disorders, and it has been a wonderful opportunity for dentistry to prove its worth.

Fellow members, to say I appreciate the honor that you bestowed upon me last September, in electing me to the presidency of this great body, is only a slight attempt to describe my thanks. I assure you from the depths of my heart that I had rather represent this body of dentists as its chairman, than any other organization in the State. I am also thankful for the meeting being held in Chattanooga. It is a great pleasure as well as a convenience to arrange a convention at home. We have worked hard to give you a good meeting this year and I want to especially compliment the different committees. When the men of the several committees were notified of their appointments, not one declined, but in nearly every case wrote me a letter stating that their shoulder was at the wheel. Whatever the success of this meeting may be, it is to a large extent due to the untiring efforts of these committeemen. I feel very flattered that our program committee has arranged such a magnificient program, bringing to us these men of national reputation, who represent the best in their different lines. I also wish to thank the men on our program for the sacrifice in leaving their practice and coming to us for these three days. The members of our local arrangement committee have certainly done their part well. These gentlemen have been meeting most every week for weeks, working out an arrangement by which the most could be accomplished, and being satisfied with only that which seemed as near perfect as possible.

The recommendations I wish to make are few. *First*, I want to recommend that our state dues be raised from $2.00 to $6.00 per annum. It seems only fair that our dues should be enough to arrange for one or more essayists or clinicians each year from outside the state. By this means we would avoid a lot of trouble raising money by subscription; and I think it only just that each member pay his proportionate part, rather than that the obligation fall altogether upon the liberal. This year we have had to raise quite a sum of money by subscription, and when we resort to subscription the committees usually expect the men in the cities to bear the burden of this amount. The Tennessee State Dental Association belongs to every man who is a member of it; every member has the same amount of stock in it; every member is in the same capacity responsible for its growth and its existence, and every member should derive the same benefit from our meetings. So if we increase our State dues from $2.00 to $6.00 per year, we should be able to bear the expense of our meetings with the funds in the treasury and not have to ask for personal subscriptions and donations. I know of some State associations that assess each member who attends the meetings the sum of $50.00; one is the Oklahoma Association, and they usually have good meetings. Our committees have tried to arrange a good meeting this year and feel that we would have to "go some" to improve on it. Next I wish to suggest that the State be divided into component district societies; this to be begun now and worked to a termination as early as possible. And in conclusion I want to ask that each number on the program be held promptly on time as indicated on the program.

We, the committee, appointed to report upon the president's address, wish to commend the terse, definite and scholarly manner in which the subject matter is presented. The recommendations, few in number, seem to us most necessary to the further advancement of our State association; therefore, we earnestly commend the attitude, which our president has taken, and approve the adoption of the two recommendations, namely, that of increasing the annual dues from two to six dollars, and the division of the State into Component District Societies.

Without elaborating upon the evident advantages to result from the adoption of these recommendations, we wish, in offering them, to congratulate the State Association upon having as its president, one who has the vision of greater educational opportunities wherein each of our members may broaden his capacity for more efficiently serving suffering humanity.

Respecftully submitted,
J. D. Towner,
A. J. Cottrell,
A. G. Buckner.

VALUE OF THE X-RAY IN THE DIAGNOSIS OF FOCAL INFECTION IN THE MOUTH*

BY R. BOYD BOGLE, D.D.S., NASHVILLE, TENN.

ONE THING that dentists fall short in is, that we do not make a thorough examination of the patient. We do not make a thorough clinical examination.

I was criticised a while ago for removing an upper lateral incisor, because the man who saw the X-ray and saw the tooth after it was out and talked with the patient, did not agree with my diagnosis and method of procedure. But I had a further clinical picture of that tooth. The patient had a great deal of disturbance, a marked swelling, and the right eye was affected. There was a thickening of the periosteum and destruction of the labial plate over that tooth, and that was found to be the case when the tooth was removed.

It was said last night that the radiograph, which we must remember is nothing more or less than a shadow picture depicting the different tissues on your plate, should be very carefully used. If we did not with the X-ray have a varying density of tissues, we of course would have a sameness over the entire area. I want to call attention to three things as the basis of the X-ray work.

First, normal anatomy and histology of the teeth and jaws, together with anatomic variations. That is the first principle we lay down. Without a knowledge of these things we cannot tell disease when we see it. We must know tissue. In the Mayo clinic sometimes a patient would say, "You are wrong; I have no trouble with my teeth and have no pain." Dr. Gardner had a radiograph of a full healthy mouth, and when he showed the patient that, and compared it with the patient's mouth and pointed out the difference, it was very convincing. If we do not know healthy tissue and normal tissue, we have a bad beginning from a diagnostic standpoint in X-ray work.

Second, the appearance that the Roentgen-ray or the radiograph should impart to the plate and films after passing through normal tissue and anatomic variation. We know some tissues vary in anatomic variation. We know some mouths have a thicker plate than others. We find tubercles more highly developed in one case than in another, and that must be considered.

The third thing we must know is special dental pathology, both from the clinical side and the histopathologic side.

After we have mastered these three things then we are ready to take up the various abnormalities produced as shown in the radiograph.

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*Stenographic report of a talk before the Tennessee State Dental Society, May,1920.

Many mistakes are made in the mental foramen. We do not find much variation in position of the mental foramen, but we find it sometimes, and if it is a little nearer or farther away, if the radiograph doesn't give you the true perspective, some say there is an alveolar process with destruction of bone. That shows they have not studied their case.

In our examination, it would be well, before we go to the X-ray machine to make our records, to have a diagnostic chart to go along with the patient's record. Begin at the same place every time in the mouth. If there is a missing tooth, mark it out; if you are suspicious of a tooth, make a question mark; if there is a gold crown, put "G. C.;" if there is a tooth with a bridge or abutment, or a T. C. crown, make a note of it, so you will have all of that before you. Get the history, whether the patient has headaches or pains or any fullness in the head, any pain located in any certain region, whether or not he tires easily without apparent cause, whether upon sitting down he has a tendency to go to sleep, whether he rests well at night or is nervous. Those things should be made a part of the record before final diagnosis.

The question was asked a few years ago, "What teeth should be X-rayed?" The answer was, "We do not know until we have X-rayed them." Very often we find evidence of pathology where we least suspect it.

All teeth that are crowned or that have large fillings; all teeth that are not normal as indicated by the color and general condition of health and freedom from large cavities, always can be suspected of possible trouble. What is the general look of the mouth? Do we find any evidence of meat pockets?

I wish it were possible always to restore the contact points in restorations. But that is a very hard thing to establish in the profession. Yet that is one of the worst conditions we find from the disease standpoint in many mouths. We find they have food impactions and lack of proper contact points which make disease around the tooth. It doesn't signify that a man can not have focal infection because he has no dead teeth. That is not true. One of the worst systemic conditions I ever have seen was where there wasn't a filling in the mouth, and yet the whole mouth was reeking with filth from diseased areas not properly taken care of.

We should make a note on the examination chart as to the clinical aspect, whether it is good, bad or doubtful.

The profession is relying too much on the X-ray for diagnostic purposes. They are using them only in some cases. We must be better informed. We must know more than the X-ray shows.

If there is a doubtful case from your radiograph, check it up, and prove or disprove the evidence produced on the radiograph. If you want an opinion in a certain case, be sure to give your expert a history of the case. You may save him the embarrassment of a mistake in diagnosis.

We know that the rays penetrate substances in the inverse ratio of their densities, so we find the things in the mouth that check the rays first are metallic crowns, fillings and root-canal fillings. The type of filling that does not check the ray does not show, although the roots may be filled. As a rule, cotton fillings do not stop the rays. They do not show they have been filled with cotton. (Laughter). Some of you smile at that. I had a patient, a boy, come in a while ago. His dentist had left some cotton in the tooth. Very often, of course, the patient is responsible for that. A man came in and said he had had some disturbance, and the dentist had sealed up some cotton in there under a cement filling. The patient had a bad abscess, and the second dentist found this cotton and made a great to-do about it. He should have kept his mouth shut. The man's lawyer came to see me, and the first question he asked was, "Is it common practice to fill teeth with cotton?" I said, "I don't believe in it, but I know some men who do." And then I very quickly stopped a lawsuit. I said, "Do you remember Dr. Blackmore, who is now dead?" "Yes, he was my dentist." "Would you take his practice as being all right?" "Yes." "He used to do this: He used to take sterile cotton, dipping it in oil of cloves, and taking up all the crystals of iodoform he could get and pack it in there, and he believed it was all right. And some men believe in filling them with orange-wood sticks." He said, "That puts a different aspect on the case," and that ended the suit. We of course should be very careful what we say to patients such as those.

Metallic crowns come first, then fillings, then the enamel of the teeth, then dentin, then cementum, then the cortical bone and cancellated bone, then the medullary spaces, canals, foramina, and the soft tissue. We do not see much soft tissue, because in our developing we develop those out, and usually we aren't looking for anything there unless we are suspicious of tumor. Dentists are not called upon to consider soft tissue.

We must take into consideration first the number of roots of a tooth, the shapes of those roots, the canals, etc. Many have had trouble with the upper first and second molars, where there are three roots. Sometimes we think there are more than that!

McCormick, of California, has given to the profession a technic that in many cases will give you excellent results. Of course your rays go straight, but we know the rays radiate. If we get far enough off, possibly twenty-four to thirty inches, the rays will give you a good interpretation of those buccal roots on your film in the mouth.

We have other conditions than the alveolar abscess. Start first with the proliferating periodontitis. We have made our clinical examination, and now start with the radiographic examination to see how much destruction we have along the margins from the presence of tartar and accumulations of debris. We cannot treat pyorrhea intelligently from the sense of touch only. Some teeth are hopeless from the beginning, and the clinical and radiographic findings show the teeth should not be kept.

The chronic alveolar abscess and the dental granuloma. One point both the dental and medical professions have been slow in is, that they do not take into consideration in the radiographic examination that we have two plates of bone on the buccal and lingual or palatal, and those plates are less dense than the cancellous bone in between. We find we have a large destruction of this cancellous structure of bone that doesn't make any impression on the buccal plates. Sometimes we remove a tooth not condemned by the X-ray but on clinical findings, and when we get in we find a large infected area.

Study the X-rays for what they contain. Don't simply look at them, but study them. You will be surprised at the new things you will find on subsequent examinations.

As to apical granuloma, if the disease goes beyond the root end and has affected the tissues beyond, simply removing the tooth does not remove the infection. One of my friends said he had been extracting teeth for forty years, and never had curetted a socket. But we heard these men last night tell of the various conditions they find. It doesn't mean that an edentulous mouth cannot give trouble. They all should be checked up. Sometimes you will find areas of destruction that have been there for years. You may find roots or something else. One man told me a granuloma was nothing but granular tissue, and was not dangerous. Dr. Roseneau showed me some cases. They had a case of eye trouble. They took out the pulp of a tooth, and they isolated the same infection from that pulp that they found in the eye. He showed me a granuloma. There were four different strains of streptococcal infection, all of virulent type and all in the blood stream. The bacteria were going right into the system. So we know these are not harmless tissues.

Another thing that confronts us is the lateral abscess. Dr. Black tells us in a very effective way about some of the things we find about the investing tissues of the teeth. The X-ray is valuable to us as showing infection, how much destruction there is, and whether we have enough tissue there to warrant us in assuming the responsibility of bringing it back to health. We must study our cases in X-ray work very closely.

Then there is pyorrhea and exostosis of the root apex, and the diseases of the marginal part of the periodontal membrane, so-called. The difference in penetration, the difference in development of X-rays always show a difference so far as the bone tissues are concerned. You always should use the same back-up and penetration so as to compare results. A man said to me, "I have gotten bone regeneration in three months, and here is the picture to prove it." I said, "Do not deceive yourself. Your picture is so thin it doesn't prove the condition

Have the same condition from the penetration and development standpoints, and then you can make the comparison."

We must consider also what we get from abnormal pressures in impacted teeth, cuspids, sometimes bicuspids and sometimes third molars. Oftentimes we have marked absorption, and particularly is that true if we are near the inferior dental canal, because the tissues there absorb very rapidly.

The use of the ray in post infection is very necessary. We find teeth that look suspicious. We had a case that discharged on the left side, but the teeth seemed vital. Going around we found a lateral incisor on the left side that seemed bad. It was opened and cleaned out, and the dentist suggested pumping a solution through it. He did, and you could see it bubbling out on the other side.

The location of the points of infection is important. We find frequently where the primary point of infection has extended over and taken in the adjacent teeth. A chronic condition can take on an acute form and give trouble, and we must not forget that. The X-rays also give us an idea how much we should sacrifice and how much not.

Let your X-ray picture mean to you all it is possible to mean, but do not ask it to mean any more. Do not ask it to give the history of the case. Where you have border-line cases, where the blood pressure is high, where the patient has a neuritis or rheumatic trouble or rheumatoid arthritis, we do not say the teeth are responsible for that, but it is possible for the teeth to be a contributing cause.

When you have made your examination, do not say, "We are ready to clean out the mouth." Have a physician examine that case from head to heel. He may find things you never dreamed of. Sometimes he will say, "Do not do anything. The patient cannot stand the shock. Wait a few days, get him in proper condition." He checks him up again, and will tell you to begin very slowly.

Sometimes we are called into consultation by the physician, and we have not studied the case much, and we really aren't of very much help. They have to assume the responsibility, and so they say, "We want certain teeth taken out." The physicians will not take us into consultation if we cannot render them assistance.

Do not promise your patients too much. You do not know the tissue change that has taken place in the joint or muscle, or in the heart valve or muscle, from streptococcal infection. You don't know what part your mouth infection has played. If we tell the patient his rheumatic condition will get all right, it may or it may not. We should tell him we hope to do some good and believe we can offer some help. But with an incurable condition in the mouth, teeth that cannot be treated and brought back to a condition of health, you should be sure not to promise too much. The chronicity established oftentimes in tissues comes to such a point that Nature cannot restore them to normal, and you cannot bring those tissues back to a condition of health.

A CLASP FOR PARTIAL DENTURES

BY C. H. WOOLGAR, M.D., D.D.S., MAGDALENA, N. M.

(Written for the DENTAL SUMMARY)

The satisfactory retention of a partial upper or lower denture is often more difficult than the retention of a full upper or lower denture, and some attachment of the partial denture to the natural teeth is required. The form of attachment here presented, in practice has proven very satisfactory, quite easy to construct, easy to place and retain in the mouth, easy to keep clean, no alteration of the natural teeth except construction of occlusal groove. For partial lowers it is the most satisfactory clasp I have seen, but it is not as satisfactory for partial upper as the Roach attachment.

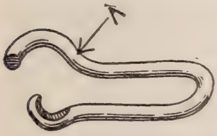
Fig. 1

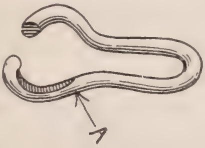
Fig. 2

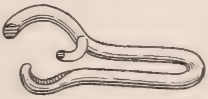
Fig. 3

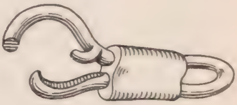
Fig. 4

The technic for constructing the clasp is as follows: Take a piece of round clasp wire, gauge eighteen, about two inches long; for lower right cuspid or bicuspid, bend into shape of *Fig. 1;* for left cuspid or bicuspid bend into shape of *Fig. 2;* at "A" solder a piece of round clasp wire to form the occlusal rest as in *Fig. 3.* An occlusal groove is cut in the occlusal surface of the tooth to receive the occlusal rest of the clasp. Wrap one thickness of a piece of vellum vulcanite rubber over the body of the clasp as in *Fig. 4.*

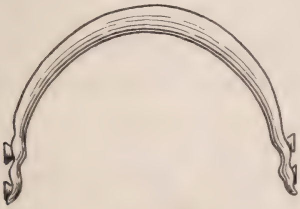
Fig. 5

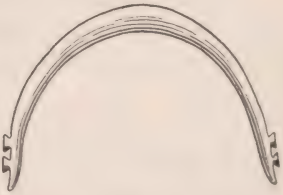
Fig. 6

The tooth on the cast corresponding to the tooth we wish clasped; scrape the lingual and buccal surfaces, slip the clasp over the tooth down to the edge of the gums. The clasp is firmly held in place by being vulcanized into the plate. There is no mutilation of the tooth clasped, except the occlusal groove; the clasp clings to the tooth with a tenacity that is very satisfactory to the patient. The clasp may limit the room in the vulcanite for the lingual bar. This can be overcome by soldering (16kt. solder) lugs on the outer surface of the end of the lingual bar, as in *Fig. 5.* The lugs are vulcanized into the plate and take up very small unused space.

There is no good reason why the bar should extend back into the body of the vulcanite as at present, and take up space required for clasp and teeth. It is to be hoped that a smooth lingual bar something like *Fig. 6,* will soon be obtainable.

DENTAL OFFICE EFFICIENCY AND THE APPLICATION*

BY HARRY J. BOSWORTH, CHICAGO, ILLINOIS

I HAVE BEEN ASSOCIATED with dentists for thirty years, and, knowing them as I do, have had a wonderful opportunity to make an analysis of their condition. The dentist goes through college, and is told if he does his work to the best of his ability, the fee will take care of itself, but it hasn't always worked out in most cases. Some men have paid so much attention to their professional technic and so little to the business side of dentistry, after a time they were living on the bounty of their friends.

Dentistry is a one-man business. You only can produce when you are able to work. When you leave your office you quit earning but your overhead expenses go on. No fee thoroughly understood between the dentist and his patient is too great, provided the patient has been told the truth about the possibilities of his or her case and a fee fixed for the work to be done. If you do not tell them what to expect, later on you possibly must accept their version of the fee they expected to pay which is lower than yours, and then you are in trouble. You can fix a fee for every piece of work, and you can fix it more equitably before you start than after you finish. Most times dentists' figures are never put down until they are put in their ledger, when the entire case is finished, and many times they are changed after they do go into the ledger, and almost always downward, showing the fear that creeps into the dentist's mind when these fees are being arrived at in a hit and miss manner.

I can take any man in this audience and double his income, if I can have him relax long enough to put into action some simple, common-sense things which I will outline, and which is being carried out in all successful lines of endeavor. You build the wall of your own limitations. It may be subconscious to a certain extent but it is done just the same, and if you wish to improve you must remove those self-imposed walls of limitations. You cannot work your hands any faster, but many times the advice given to a patient is more helpful than the construction work you might do. Do not talk mechanics when going over a case with your patients; it must mean more than that to your patients;

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*Read before the Northern Ohio Dental Society, June, 1920.

it means health, so talk health. We have dental specialists today who do not do any mechanical work and yet have all they can do in dentistry.

Seventy per cent. of the efforts of the general practitioner in dentistry is lost motion. I classify them as follows: *Productive*—crowns, bridge work, gold inlays, synthetic fillings, lingual bars, pyorrhea, X-rays. *Non-Productive*—treatments, plates, silver fillings, cement fillings, examinations, cleaning teeth, stopping toothache, extracting, anesthetic, baby teeth, broken appointments.

I do not believe you dentists know how long it takes to treat teeth, and if you did you would handle it as it should be handled, viz., according to the time taken and skill required to accomplish the results. At the fees the average man gets for this kind of service the effort should be given at the risk and expense of the patient as in the medical profession. The tooth is his and not yours, and you should not accept the responsibility for that tooth, except to do the best you can and be paid for it. Most contracts for filling teeth needing treatment, are sold by the dentist as "treat and fill;" the dentist will not get any money until the tooth is filled. Always handle these cases quoting a fee for the filling, plus treatment, and I would tell the patient there are two ways of treating a tooth. One is with the forceps; we all know that is all right. And if the patient wants to try and save the tooth all very well, but he must do so with a full understanding of the possibilities of failure, and in either event the risk is his. And the dentist must be paid for the time given in trying to save the tooth. Heretofore in the average office this has been grief, but it can be put on the profit side of the ledger if a dentist only realizes the time spent and charge for it. I do not want a dentist to say to his patient that he charges by the hour. It's too much like a factory. But to make an office productive you must find out how many hours you have at your disposal, and how much you must charge per hour to make your income a satisfactory one, and then make your charge accordingly. You can barely figure 1500 hours for a year's work, or six hours per day. I would always say to a patient, "I will do your constructive work for so much, plus treatments." Suppose you do treat it, but after all the tooth has to come out! Then the burden is back to the owner of the tooth where it belongs.

Many dentists have trouble in collecting. That is their own fault. If they will only tell a patient what the work will cost before it is started so that he may make provision for the payment, and furthermore tell him the work must be paid for as it progresses, and see that it is paid for by sending out statements on the first of every month for complete or incomplete work, you will have no trouble. Take fewer patients. Be as careful in selecting your patients as they are in selecting you as a dentist. They don't just come to you off the street. They are in most cases referred to you, and as a consequence are seventy-five per cent. sold when they do come to your office. They are not shoppers then, and if they become so, it's because you make them so. Sell dentistry for what it is, do not promise too much, sell it for what it is—patchwork. Even the very best dentistry is only temporary, and the patient should be told so, so he will not expect too much. Plates are non-productive. If someone else built a plate and did all the work, I wouldn't want to assume the responsibility for that plate for less than a hundred dollars.

If you want to make a fair profit, I believe you can sell plates for what they are and get a good fee for them.

Discourage the patient rather than promise too much. Tell your patient Nature never intended there should be a plate made, but science came along and made it possible, perhaps in a slipshod way. Tell him what your experience with plates has been and that will be discouragement enough. I like to compare plates with a wooden leg. The wooden-leg manufacturer, if the leg happens to be off at the right place, can make the man a fairly good wooden leg, but it is still an artificial member. There are many things a patient cannot do with a wooden leg, but he is satisfied to have it for what he can do with it. The wooden-leg manufacturer has found out by experience that he must have his client's cooperation if it's going to be a success, and the best way to get that is to have the client own the leg. Sell plates for what plates stand for, and if a patient has to replace a plate once in a while, it is no more than he has to do with the other things he is buying and wearing out, or getting tired of.

If an alloy filling is indicated, why shouldn't the fee for it be the same as for gold, unless you are selling merchandise? You are selling service based on skill and not merchandise. What would you think of a physician with two prices for an appendicitis operation? Cement fillings are not used much, but when it is indicated why not get a profit fee for time spent on same and disregard the material used? Examination is the greatest time waster the dentist has. Many times the only reason patients ask you to look over their teeth is that it doesn't cost anything. You don't tell them anything, and they don't pay you anything, so perhaps it is even. But diagnosis is the big thing in dentistry today, and they should pay for it, and the only reason they do not is because you do not ask them for it. Take a full set of X-ray pictures, make a study model and visualize the mouth to the patient, which shows that you are interested in his case. In medicine and surgery today, a physical diagnosis means something, and is paid for, and in dentistry an opinion on the teeth and mouth conditions by a dentist, is worthy of a fee equal to what is charged in medicine and surgery, and if it is not don't give it.

The man who cannot get enough income out of dentistry usually is the one who has too many patients. The hardest day you sometimes put in, is the day you do not have any real production. The day is coming in dentistry when many men will do nothing but dental diagnosis. Look over the case and have the patient come back for the diagnosis, and then if he wants to go somewhere else for the work, let him go, but there will be a fee for the diagnosis.

Cleaning teeth has, in the past been another complimentary effort. Throw pumice all over the office and get a dollar for it. There was no basis for the dollar charge except it was the smallest sum a dentist could think of. In order to sidestep this grief, tell the patient that to be fair to him and to yourself, the little service you can do for a dollar he can do for himself with a tooth brush. But when he comes to you for real prophylaxis, a work that only a dentist can do, make a proper charge that will show a profit. The biggest thing before a dentist today is prophylaxis, and state laws are going to be enacted to provide for prophylactic nurses to render the service as it is needed. There are not enough dentists to do it, and if the dentists do not put it through, the government will do it for them.

Do not do anything unless you are paid on a profit basis. Handle whatever charity cases you have to, but be sure the charity is warranted.

Stopping toothache you do not charge for, and yet the nose and throat man charges for all these little services. A lawyer charges not for his time, but for what the service is worth. Suppose you got a toothache at midnight, what would you give to have it stopped? And the public will pay for this service. You won't take advantage of anybody, for they won't let you.

Have a minimum fee per hour, which is your danger point and which shows a fair profit.

Extracting is surgery, and there is as much responsibility following it as if you cut a leg off. I would not assume the responsibility for less than $5.00 as a minimum fee, and I do not think you have to, as I know of no class who could not pay the fee without a hardship. Extracting is a big possibility, but just think how you belittle the operation. You anesthetize a patient and remove a tooth surgically. Is a charge of $5.00 for that too much? You administer the safest and best anesthetic—nitrous oxid and oxygen. And yet dentists all over the country will administer gas and take a tooth out for $3.00. If you should call in a physician to give the anesthetic, he will charge $5.00 and perhaps $10.00. Do not belittle your proposition. This is a responsibility that you haven't a right to assume for a picayunish fee.

"Baby teeth" were put in here at the request of the president of our State Society, who said that in his practice this was one thing that worried him, a custom that had been handed down along with the idea of riding for half-fare. The children are harder to handle than the adults. Why not be paid for handling them? Children's dentistry is a big specialty. Many dentists are now handling nothing but children.

It is more preventive than anything else. Dr. Phillip Thomas, of Minneapolis, sells this service by the year, and he usually is paid in advance. Little tots come in twelve times a year for prophylaxis and he is watching their progress, and is doing a tremendous amount of educational work among those children. Yet the average dentist does that work at a loss, because that has been the custom and he is following it.

Many times the better dentists who are giving the very best dental service keep their fees so small that it is difficult for the young man just locating to properly fix his fees so as to show a profit. He feels sometimes he must put his prices on the level of the older practitioners. Yet if he only knew it, he could go right on and charge his own prices for his services regardless of the older practitioners. Dentists let patients break appointments and do not charge for them. In justification they sometimes say there is other work they can do, but they know that is not true for when you have made preparations for a patient and waited some minutes overtime, there is always a great deal of wasted energy and temperament before you can take up your other work.

QUESTION: What about the ones who come in for examination, and you make an appointment, and they do not come back? MR. BOSWORTH: Examine them only by appointment, and then charge for it.

QUESTION: Would you apply the same plan to all classes of patients? MR. BOSWORTH: No dentist can afford to work without a profit and that takes in all classes of people, and they naturally charge the individual case outside of that, according to the type of patient and services rendered. The dentist knows what he is delivering and he should charge whatever is right.

QUESTION: How would you collect for broken appointments on examinations? MR. BOSWORTH: The same as they collect in a theater when you buy a ticket and do not occupy the seat. Tell them first that the charge will be made whether they keep the appointment or not.

QUESTION: Is it harder to double a $10,000 practice than a $3,000 one? MR. BOSWORTH: No, for one is a $10,000 man in the first place.

QUESTION: Suppose there are three men in one town with ability along different lines. People go to each one of them and there is a certain basis of charges. To a certain extent there might be a loss of patients to another town. MR. BOSWORTH: The moment you fear patients are going to leave, you are beaten before you start. You cannot handle all the people today. There aren't enough dentists to deliver one-tenth of the necessary dental services. If you think so, take a mouth mirror and explorer and go through the dentists' mouths in this room and you will find my contention proven.

QUESTION: How do you account for the fact that the advertiser who works cheap makes more money than the other dentists? MR. BOSWORTH: He works other people and makes a profit out of them.

You know what is right and wrong and you must be paid for what is right.

I think each man should have one or two of the best lady assistants he can get, and you can get them only by paying the best price. You will not get the best services for a flat price. Give the assistant five per cent. of your improved business in addition to her salary. Then she will help you sell dentistry and save your time. You should have an office that will permit you to finish your work with one patient, so that he can leave the office without coming into contact with the other patients who are waiting.

A good office assistant can pay her own wages and all the overhead of the office, with X-ray pictures alone, and it will make you more efficient in your work too, because when the pictures do not cost you any personal effort you will use more of them.

Put your day on a six-hour basis, and see that you get what you should for that amount of work. Do not take a minimum fee for the whole six hours. The minimum is your danger point only.

Now I have told the patient there will be a charge for examination. I have the clinical examination, the history of the patient, a study model and an X-ray chart. Say I am working on a six dollar an hour basis; that is the minimum, and the other cases where you can charge more than that will bring it up to $10,000 a year. If you do your work my way you will double your income and you will do it with less work. After going over the case with the data before me, I estimate the time and make the charge. This I put on the examination sheet and say plus treatments and broken appointments, if any. And I would also write the patient a letter setting forth my version of it so as to avoid any possible misunderstandings. Payment on the first of the mouth for all complete or incomplete work as shown by the books. And the patient pays, which makes him a part owner in that dentistry. And it makes it much easier to pay. A large bill at one time is hard for anyone to pay, but it is not hard to pay it in installments.

Be sure to get the patient's full name. It makes it easier afterward in your dealings with him. When the vision of the mouth is fresh in your memory, put down in your appointment book the work to be done at the next sitting; that helps you when the case comes to you again and it enables the assistant to get ready and anticipate your needs. Have a time stamp. Stamp it when a patient arrives and when he leaves. This stamp record is handled by the dentist. Put transient patients down in a different colored ink if possible. When the day is over, the assistant puts in this column the amount of time you have worked, and puts down the minimum charge lightly with pencil. Then at the end of the day you spend ten minutes with her and make the permanent charge, which always is sure to be at the minimum fee and in many cases plus.

QUESTION: Suppose when you finish you find your estimate has been too low. MR. BOSWORTH: That will be valuable experience to you. The next time you will know you must make the estimate higher.

QUESTION: Suppose you have it too high? MR. BOSWORTH: Then you are a good estimator.

Mail your statements a day before the first of the month, because the first bills received are the first ones paid. Just send the statement, "services rendered." If you sell your cases before you start, no explanation is needed.

A prophylaxis list is a good thing to have for it keeps the patients from crowding in on each other. The assistant can handle that and get your patients in at the right time. The collection sheet is kept by the assistant and is always at the desk so as not to be forgotten.

QUESTION: Would not the bonus plan also carry out well with the nurse at the chair? MR. BOSWORTH: Yes, we pay her a bonus too. The best way to handle employees is to make it possible for them to get more by doing more. The bonus idea is good whether applied to operators, nurses, office girls or what not.

IMPRESSION OF CAST CLASP AND REMOVABLE BRIDGEWORK

BY VICTOR KNAPP, EVANSVILLE, INDIANA

A simple method of making impression of cast clasp and removable bridge work, using modeling compound instead of plaster, taking the impression laterally instead of from above, down, reproducing the facsimile of the teeth with the natural contour, and showing ease of separation without distorting the model by breakage in any way. Make your own trays to suit each individual case. Take a case that you could not do with plaster, and you can do this way laterally and can get it right.

In reseating the first half of the impression after you have it trimmed down to the center of contour, before you are ready for your final impression, dip the whole impression into hot water so that you soften it all over instead of in different places. This makes for uniformity. Dip in hot water twice and reseat it to the case. Then you are ready to go ahead with the other half of the impression.

REPLACING NEW RUBBER ON A PLATE

BY J. H. NAUS, SOUTH BEND, INDIANA

In this clinic I am replacing new rubber on a plate where the old rubber has been made brittle and useless through extensive repairs. *First,* I run a model, then cut out the vault of the plate in one piece in an upper, and cut the remaining part into four or six pieces to facilitate parting in the flask. I then reassemble the pieces on the model with a little wax and flask the case. From here on the case is treated as a new case, simply running through the vulcanizer and finishing

FUNDAMENTALS OF OPERATIVE DENTISTRY*

BY W. H. O. MCGEHEE, M.D., D.D.S., CLEVELAND, OHIO

PROFESSOR OF OPERATIVE DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND SUPERINTENDENT OF CLINICS IN THE DENTAL SCHOOL OF WESTERN RESERVE UNIVERSITY.

COMBINATION FILLINGS AND METHODS OF POLISHING FILLINGS

COMBINATION FILLINGS

A COMBINATION FILLING may be defined as one composed of two or more substances introduced separately into the cavity. Since the introduction of the cast gold inlay into modern dental practice, the use of certain of these combinations has been quite largely abandoned. However, it is felt that there still is an occasional indication for most of them, while a number of others are a part of the regular routine at the chair; hence, a description of all is included in the following pages.

All filling materials possess certain desirable and undesirable qualities. By combining two or more of these substances in different parts of the cavity, the disadvantages of one are often rendered nil by the virtues of the other. This is the chief advantage claimed for combination fillings. The combinations used are herewith tabulated, viz.:

A Platinum and gold.
B Cohesive and non-cohesive gold.
C Gold and tin.
D Gold and amalgam.
E Gold and cement.
F Gold, amalgam and cement.
G Amalgam and cement.
H Alloy and cement.
I Basic zinc phosphates and silicate cement.
J Gutta-percha and cement.

The advantages of the *Platinum and Gold* combination are greater density and more harmonious color (greyish) for patients of dark complexion. These materials may be combined in the following forms:

A A sheet of gold and a sheet of platinum are superimposed one on the other by the operator, cut into strips of desirable size and then made into rolls, ropes, or other forms.

B Platinum-Gold. A sheet, one side of which shows platinum, the other gold, is supplied by the manufacturer ready for use.

C Platinum and gold foil, composed of an alloy of platinum and gold. This preparation is lighter in color than ordinary goldfoil. The two latter forms do not in a strict sense come under the definition of "combination filling" previously given.

(*Continued from page 905, OCTOBER SUMMARY).

In manipulating platinum and gold in combination, the cavity is partially filled with gold, when surfacing of the filling is done with the combination material, working it after the manner of cohesive gold.

The advantages of the *Cohesive and Non-Cohesive Gold* combination are rapidity of manipulation and closer adaptation to inaccessible cavity walls. The method of manipulation of this combination is as follows:

A In simple cavities, the floor and lateral walls are covered with non-cohesive gold, when the cohesive form is then anchored into it with a small plugger point, the balance of the filling being completed with cohesive gold.

B In proximal cavities, the gingival wall is covered with non-cohesive gold, preferably in the form of cylinders, mats or cushions. In complex cavities (*Figs. 158, 159, 160*), these may be built up a distance of two-thirds or three-fourths the way to the top of the step, or even level with it. Many operators in the East place a matrix in position for this part of the work, while those who follow Dr. Black's methods decry this procedure. The occlusal portion of the filling is completed with cohesive gold, anchoring it in small pieces with fine-pointed pluggers into the surface of the non-cohesive gold, or into convenience angles, or a special groove cut for its reception.

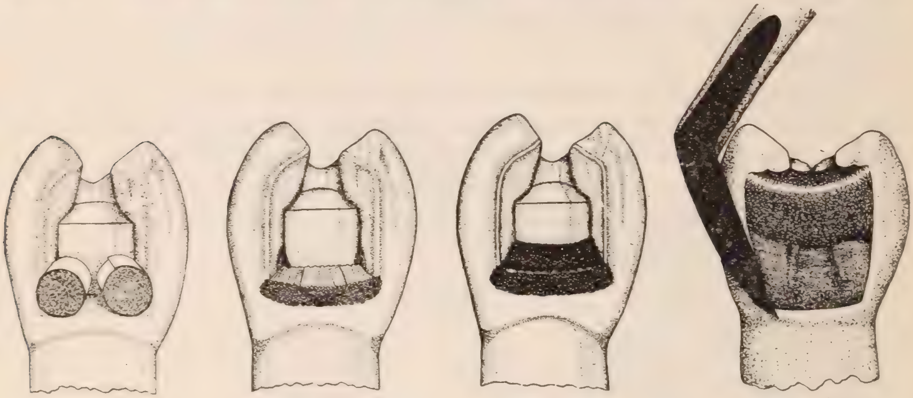

Fig. 158 Fig. 159 Fig. 160 Fig. 161

Illustrations showing the method of covering the gingival wall in proximo-occlusal cavities with non-cohesive gold.

Fig. 158—Two cylinders are placed on the gingival wall, one end resting against the axial wall and the other protruding slightly beyond the gingival margin.

Fig. 159—A third cylinder is placed in between the two shown in Fig. 158 and all three cylinders are wedged in between the buccal and lingual walls and forced into the gingival point angles, thus covering the gingival wall of the cavity.

Fig. 160—After thorough condensation of the three cylinders placed in the previous illustrations, three additional cylinders may be added in the same manner and thoroughly condensed, when the remainder of the filling is plugged with cohesive gold.

Fig. 161—Removing surplus filling material at the gingival portion with a gold trimmer or knife.

402. Name the *Advantages* and describe the *Method of Manipulation* of the *Gold* and *Tin Combination.*

They are the same as previously mentioned for cohesive and non-cohesive gold. In addition, some claim antiseptic and preservative properties for tin, when it contacts with dentin. Tin, if used at all, should be adapted only in unexposed locations.

403. Name the *Advantages of Gold and Amalgam* in *Combination.*

Against subgingival walls, amalgam may be placed with greater ease, freedom from moisture, and more quickly. Amalgam also cheapens the cost of construction.

404. Describe the *Methods of Manipulation* of Gold and Amalgam in Combination. Two methods are herewith given:

First Method, with the matrix in position, fill the gingival portion of the cavity with amalgam. After it has hardened at the next sitting, make the necessary retention form and complete the filling with gold without the matrix.

Second Method, fill the gingival portion with amalgam as before. Condense onto the surface of the still soft amalgam a thin layer of gold, preferably crystalline gold, which immediately becomes amalgamated. Place on another layer in the same manner, and still another, condensing thoroughly and continuing until all of the mercury has become amalgamated and the cohesive properties of the gold begin to appear. Complete the filling with cohesive foil with the matrix in position.

405. Name the *Advantages of Gold and Cement in Combination.*

A Non-conductivity.

B Avoidance of gold color through thin labial and buccal walls.

C In method number two (see answer to 406), a time saver.

D In method number two, elimination of pain incident to the making of deep retentions in sensitive dentin.

E Cheapness.

F Reduction of time of the operation in method number two.

406. Describe the *Methods of Manipulation* of gold and cement in combination. *Two Methods* are in use.

First Method, place a cement intermediate in position and allow it to harden. Weak walls may be strengthened and thin walls covered, to prevent the showing of gold through the enamel. Make the cavity retentive and place the gold in position.

Second Method, partially fill the cavity with a quick-setting cement. Before it hardens, anchor into it crystalline gold and complete the filling with this or fibrous gold, being sure that all margins are free of cement before adaptation of gold against them. This latter method is not recommended for students' use for obvious reasons.

407. Describe the *Gold, Amalgam and Cement Combination.*

Place a cement intermediate, fill the gingival portion with amalgam and complete the filling with gold.

408. Describe the *Amalgam and Cement Combination.*

The advantages and method are practically the same as mentioned for gold and cement.

409. Describe the *Alloy and Cement Combination.*

A mixture of alloy filings and oxyphosphate of zinc cement powder is made, when the cement liquid is added, the mass thoroughly spatulated and introduced into the cavity. A more durable cement filling is claimed. The advantages of the combination over amalgam are adhesiveness and partial non-conductivity.

410. Describe the *Basic Zinc Phosphate and Silicate Combination.*

Zinc oxyphosphate is used as an intermediate under the silicate filling, to prevent the irritation of the pulp incident to some silicate fillings.

411. Describe the *Gutta-percha and Cement Combination.*

Cement disintegrates very rapidly at gingival margins, but has some edge strength on exposed surfaces, while gutta-percha holds its own very well in gingival locations, but does not resist attrition. Consequently, gutta-percha may be used to cover the gingival walls of the cavity, the balance of the temporary filling being completed with cement.

Some of the methods and combinations of materials described do not meet with the approval of the author, and some are now almost obsolete. However, as stated in the beginning of this chapter, it has been deemed advisable to include a description of them for the present.

FINISHING AND POLISHING FILLINGS

In previous chapters, the necessity for full and complete restoration of occlusal form and proximal contour has been accentuated. In the building of all fillings, material for restoration of the proper contour and contact point should be provided, and the original cusps, grooves, and ridges on occlusal surfaces should be carefully restored. The building up to full form of the marginal ridges bounding the mesial and distal margins of the lingual surfaces of the anterior teeth, and the occlusal surfaces of the bicuspids and molars is essential to ideal results. The marginal ridges are important factors in the incision and mastication of food, and if they are not adequately provided for in the completed filling, the masticatory function is lowered, and the partial disuse and malocclusion resulting frequently will be productive of pericemental disturbance and change of position of the tooth, through improper functioning of these organs, finally leading to pathologic conditions of the gums, as well. All fillings should be built slightly overfull, especially in the locations mentioned, to allow for proper trimming down in the finishing and polishing process.

Following is the *Method of Finishing and Polishing Fillings* in pit and fissure and gingival third cavities:

A Remove the excess with Black's or Pichler's trimming knives, "flexo" or Black's files, carborundum stones, gem points or sand and emery discs, depending on the size, location and shape of the filling. The general direction of the cutting should be toward the margins. Do not use rough stones as the outline of the cavo-surface angle is approached, for fear of damaging the margins; changing to knives, fine files, gem stones, or discs for this purpose. Trim or grind the filling down until the original shape of the tooth is restored, the operation on occlusal surfaces frequently requiring the application of much esthetic taste, as well as mechanical skill, to carve grooves and ridges and cusps to their original anatomical form.

B Polish, first with garnet and then with cuttle-fish discs, in locations where these will readily reach, finally going over the surface, if a specially high finish is desired, with crocus discs, or with chamois, felt, or moose-hide buffers, dipped in whiting or rouge. In pits and fissures, where the disc is not applicable, after the final shaping of the filling, the surface may be gone over with finishing burs, which will give a high burnish; or, if preferred, the use of wood points and wet pumice may be resorted to, finally going over the surface again with the chamois, felt of moose-hide wheels carrying whiting or rouge.

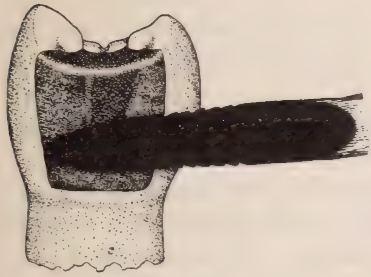
Fig. 162

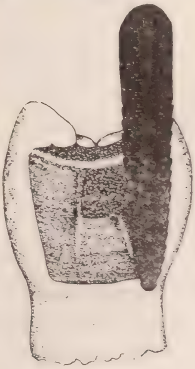
Fig. 163

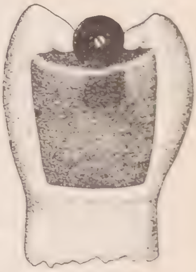
Fig. 164

Fig. 162—Removing the excess at the gingival portion of the filling with a gold file.

Fig. 163—Removing surplus material from the buccal and lingual portions of the filling with a Black file.

Fig. 164—Grinding down the occlusal portion with a stone in the engine.

The *Method of Finishing and Polishing Proximal Fillings* is herewith given.

A The gingival portion. After thorough burnishing, the excess at the gingival portion, up to a point slightly gingival to the contact point, is first removed by the use of keen Pichler or Black knives. (*Fig. 161*). This portion is then gone over with the Black files (*Fig. 162*), or the Rhein approximal trimmers, until the filling is flush with the gingival margin.

B The buccal or labial and lingual portions then receive attention, the excess being removed by the use of the knives, the files (*Fig. 163*), or, where convenient, small stones, finishing burs, sand and emery discs.

C The occlusal or incisal portions next receive attention in the same manner (*Fig. 164*), leaving the contact point untouched.

D The entire filling is then gone over again, with the exception of the contact point, with the finer polishing strips and discs (*Fig. 165*), using the discs only on the labial, buccal, lingual, incisal or occlusal margins, utilizing the strips (*Fig. 166*), for the shaping of the interproximal portion.

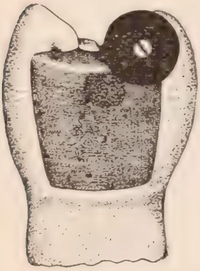

Fig. 165

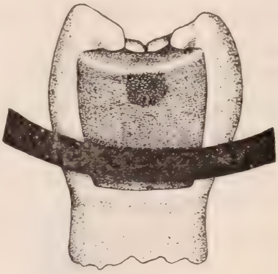

Fig. 166

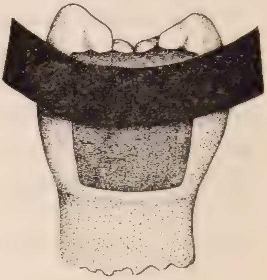

Fig. 167

Fig. 165—Polishing the buccal and lingual portions with a disk. The contact point is still untouched.

Fig. 166—Polishing the proximal portion of the filling with a polishing strip. The contact point is yet untouched.

Fig. 167—Polishing the contact point with a fine strip.

E The contact point should now remain as a small marble contact, as nature intended it, (*Fig. 166*) and is now gone over (being careful not to flatten it) with a fine linen polishing strip (*Fig. 167*), making increased separation, if necessary for this purpose.

F In case a still higher finish is desired, the exposed surfaces are now gone over with whiting or rouge on the buffers.

AMERICA'S MAXILLO-FACIAL SERVICE IN THE WORLD WAR*

BY S. D. RUGGLES, PORTSMOUTH, OHIO

(MAJOR D. C., U. S. ARMY)

THE DIVISION of Head Surgery had its origin in the minds of several ophthalmologists and oto-laryngologists, who were awake to the fact that a great many men, qualified in these specialties, would be needed by the army. A committee was formed under the Medical Board of the Council of National Defense, with the approval of the Surgeon General. Col. Logan was chairman of the dental committee. The idea of having a section of facial surgery was conceived and put into action by General T. C. Lister, then a major in the medical corps. In formulating the plans it was soon realized that the field of activity should be extended to embrace the entire range of head surgery. Accordingly the joint committee of head surgery was organized, with representatives of the specialites of ophthalmology, oto-laryngology, plastic and oral surgery and brain surgery. Major V. P. Blair was the representative of plastic and oral surgery on the committee. At the end of July, 1917, the section of head surgery was formed in the office of the Surgeon General with the four sub-sections, and the work of the Council of National Defense gradually was taken over by this section in the office of the Surgeon General.

Major Blair was in charge of the plastic and oral surgery, and at the end of August, 1917, Captain Robert H. Ivy became his assistant. One of the principal functions of the sub-section was to obtain the surgeons and dentists qualified to take care of the injuries of the face and jaws.

During the period of organization, Col. W. H. G. Logan was placed in full charge of the Dental Corps of the Army, and had control of the assignment of all dental officers, whether they were to be used for routine dentistry or for the special work connected with the maxillo-facial injuries.

The selection of the dental personnel and the general plans for treatment, equipment, etc., in the handling of these face and jaw injuries, were formulated by Major Blair and Major Ivy in close cooperation, and consultation between these officers and Col. Logan. When Major Blair received data indicating special qualifications of a certain dental man, he would then request that Col. Logan have him assigned to this work. On the other hand Col. Logan, knowing men capable of doing this special work would take up his assignment to the maxillo-facial service with Col. Blair.

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*Read before the Ohio State Dental Society, Dec., 1919.

The idea was to assign to every evacuation hospital and base hospital one surgeon and one dentist who were qualified to handle maxillo-facial injuries, together with the necessary equipment for the work. In addition ten special units were organized and taken over by Major Blair for special work and study in foreign hospitals. These were the only special units sent over, except that Base Hospital 115 was supposed to have a larger staff of especially trained men than the other hospitals.

The American government established three schools for special instruction for maxillo-facial work, Philadelphia, Chicago, and St. Louis. In all, one hundred and sixty-four surgeons and one hundred and twenty-three dentists were given the courses. Many of these men did not qualify for various reasons, and some who did were assigned to other work, just why is not known.

It was my good fortune to be a member of Colonel Blair's special units and after a few weeks in France orders were received to proceed to England for further training. The first assignment placed me in England's largest hospital, where fracture work was done exclusively. The methods differed so from the ones in America that it was a revelation. We were warned beforehand to look and listen and to keep our opinions to ourselves. This proved a wise precaution.

This institution was conducted by dental surgeons and strange as it may appear one of the cardinal principles laid down in our schools was utterly ignored. I refer to anatomical occlusion as a guide to correct reduction. Bony union was striven for regardless of deformity, the claim being made that the shortage of man power made it imperative that men should be returned to the front in the least time possible The wholesale extraction of teeth was in general practice and the use of bone graft frowned upon. All splints were cast in Victoria metal and were of the double Gunning type, being soldered at the occlusal surfaces. Modifications with vulcanite attachments also were noted. The closed-bite method was used exclusively.

A later experience in London where medical and dental men co-operated reversed the practice just mentioned and the difference was immediately noticed. All splints were cast in metal but the open bite was used in every case, after a careful anatomical relation had been obtained. This hearty cooperation of the two professions made possible the ideal result, and in cases where bony union was not obtained the parts kept in position for bone grafting. The tibial, rib, and pedunculated grafts with a non-touch technic were most common and successful. My former convictions that neither surgeon nor dentist working alone was capable of rendering the best service were more than justified after these two experiences.

At another big hospital near London, still different methods were in vogue and while the appliances were rather more elaborate, the results were noteworthy as again showing hearty cooperation. The dental mechanic is legion in England and naturally some very well constructed appliances resulted. Every facility was afforded that we might see and help with the work, and on the whole every courtesy was shown.

Later an order came to go to Paris, and here we saw the most elaborate appliances yet encountered. Time did not appear to be a factor as it was not unusual for five days to elapse before an appliance would be constructed. And in the matter of records, no detail was too trival for entry. Geo. Villian, of Paris, developed the first splint we noticed wherein the free movement of a post-elevator fracture was possible, and at no center did we see a higher order of mechanical workmanship. In other French centers, notably Lyons and Vichy, the dental and medical services united their efforts with the best possible results.

On July 18, 1918, the day of the battle of Chateau Thierry, orders came to proceed to Vichy, France, where a permanent assignment put me in charge of the fracture work of the Special Head Hospital, known as Base Hospital 115. The American government had established a thirty-thousand bed center at this beautiful summer resort totaling in all eighty-two buildings. Unfortunately for the maxillo-facial work we were off the main trunk line and for various reasons, preventable and otherwise, special cases were not routed to 115 in the numbers anticipated. We had every facility for work but equipment, and this was lost, strayed of stolen. At least it had not arrived at the time of my departure, January 14, 1919. Every makeshift known to mankind was pressed into service. From soap boxes and parlor chairs we gradually accumulated two field equipments for our clinic, while a neighboring hospital allowed the use of laboratory and X-ray department. When we took charge of the center, thirty or more fracture cases were scattered through the various American hospitals. Only temporary wiring had been employed and no attempt at proper feeding had been made. But in a short time these cases were collected into one ward and a dietitian pressed into service for their especial benefit. Immediately the atmosphere began to clear, and a definite routine was established. Originally, the object of the head hospital was to enable the assembling of all these cases under one service, the patient having passed through the front line and the advance section before reaching the center. Owing to the location as noted above, many cases were not forwarded, but the ones received, over two hundred, were the worst type and required prolonged treatment.

Each case was taken up in accord with the plan devised by the section of maxillo-facial surgery. The routine work of records, X-ray and diagnosis followed as soon after the patient's arrival as was consistent with his condition. The case was gone over with the surgical staff, and any surgical work such as curettements, extractions, removal of foreign bodies was done under ether before the splinting was undertaken. All teeth in the line of fracture, or so injured as to cause trouble later were removed except when it was imperative to retain them for a temporary purpose. This applied also to unattached bone. Then free drainage was established at the most dependent point. Hemorrhage was not a serious factor, except in badly-infected cases. Pneumonia developed in but two instances. Both of these favorable conditions were attributed to the rigid mouth requirements of our army, and a regular hygiene insisted upon from the beginning of the treatment. Just as soon as the patient was able to endure the ordeal, impressions were made in modeling compound, each section separately, then assembled anatomically. From these, wax impressions were made, the splints cast in maxilor, a silver-copper alloy, used by the French.

No single type of splint was applicable to all cases, therefore various modifications were worked out for each individual. Some required plastic considerations, but always one feature was uppermost, and that was the matter of transportation. Orders were issued that no case should be retained in France requiring longer than four months treatment, and when the armistice was signed many cases were sent home soon after the splints were cemented. This necessitated an appliance which could be opened to avoid danger in sea travel and it was not hard to arrange for. The double Gunning with certain modifications answered for many cases. Our mechanical work was not to be compared to that of the French after their four years' experience. Our work had good wearing qualities and few failures resulted. Realizing that the patient was more comfortable with splints in place, and the time of repair shortened, every effort was made to get them adjusted as soon as possible. I recall one case in which the splints were in place just five hours after the impressions were taken.

Open-bite splints were indicated occasionally, but as a rule the plastic cases were marked for operation in America. Less trismus resulted from the use of this type. A clothes pin used for thirty minutes each day usually cleared up the average case of trismus. Where posterior fragments were without teeth a saddle was cast to cover the surface as far as the retromolar triangle, and soldered to position on the other part of the splint. In spite of the fact that it would bury itself in the soft tissues no bad results followed.

Fractures of the neck and condyle were not immobilized, ankylosis being feared. If the displacement was noticeable, a flange was cast and cemented to position to act as a constant guide to proper occlusion. On two or three occasions no fixation was used in fractures of the lower third of the ramus. Displacement was prevented by the masseter and internal pterygoid muscles. George Villian's appliances for post elevator fractures were not a success in our hands as the means of adjustment never could be worked out. He told me later that they were sent out while he was away from Paris and were not correct. These cases were treated with a double Gunning, secured by a bolt after they had been reduced through the use of heavy traction by ligatures and blocks on the molars. This proved effective according to subsequent army reports.

In the bilateral fractures of the mandible, where the anterior fragment was so badly depressed, we had much success with circumferential wiring. This is done by passing a heavy silver wire beneath the symphysis and twisting the ends over the incisal portion of the splint. Strange as it may seem, suppuration does not attend this operation, and it is easily and quickly accomplished. Aviators were especially liable to fractures of the maxilla as well as the mandible; the downward plunge throwing the face in contact with the wheel or cock pit. Some type of headgear was a necessity and as the Kazanjian was not on the market, something had to be constructed from such materials as were at hand. A Kingsley or some modification usually was effective. The reductions were made without anesthetic and very often without even an orthodontic appliance. It was not unusual to have nasal and malar fractures accompanying the maxillary in which our appliances were made to supply the need. This was done by an extension lug attached to the upper splint on a level with the incisal edges. To this was fitted heavy wires or pads that were adjustable. These could be removed for cleansing or re-adjustment. The same principle was of service in the construction of fingers or pads for retaining tissues in place after plastic work. It frequently happened that a splint could not be put into its intended position when completed. Under such circumstances it was placed in the best possible position, then bandaged for a day or two when cementing was not difficult. Ames' oxyphosphate of copper was our most dependable material. Without compressed air and other office equipment, complete dryness was impossible, so a cement which would set in the presence of moisture was essential.

Upon entrance all fracture cases were placed on a liquid diet consisting of soup, porridge, cocoa, eggnog, grape juice, and milk when obtainable. Five feedings a day were given. All patients with jaws closed were kept on liquids, though many appliances permitted of semi-solids for which we were glad. The dietitian received regular daily reports and prepared meals according to it. A special meat grinder was installed for preparing semi-solids, thus allowing vegetables and meats to be added to the diet list. At first a loss in weight was quite apparent, but after the third week the gain was marked.

At the morning clinic all cases were examined and given a thorough cleansing. Beside this regular hygiene at stated hours was in charge of nurse or orderly. Dakin solution was tried and found too irritating, therefore our chief dependence was a physiological salt solution used at body temperature and with great success.

The healing of the soft tissues was rapid, for the patients were in prime condition. It is difficult to state the exact time required for bone repair, as many cases were sent home soon after splinting. One case got bony union in twenty-six days and I have since learned from army records where many cases were united upon entrance to the American hospitals. In England no case was classed as pseudo-arthrosis until six months' time had elapsed. The regenerative power of the mandible when immobilized is surprising. Short periods of movement seemed to stimulate callus formation and often was advocated in these cases.

In conclusion, I wish to pay my respects to the doughboy. We all marveled at the patience and stoicism of the British Tommy, it being our first war experience, but for real courage and fortitude and good natured tolerance of wounds and treatment and conduct toward officers we did not see the equal of the American soldier.

SOCIETY ANNOUNCEMENTS

Michigan State Board of Dental Examiners

The next meeting of the Michigan Dental Board for examinations will be held at the Dental College, Ann Arbor, Michigan, November 8 to 13, 1920. Those desiring further particulars may write to B. S. Sutherland, sec'y-treas., Owosso, Mich.

B. S. SUTHERLAND, *Sec'y-Treas., Owosso, Mich.*

Colorado State Dental Board

The Colorado State Board of Dental Examiners will meet for the purpose of examining candidates for license to practice dentistry and oral hygiene in Colorado, at Denver, Colorado, at the State House, beginning December 7, 1920, 8 A.M.

For further particulars and application blanks address,

DR. R. C. QUICK, *Secretary,*
310 Metropolitan Bldg., Denver, Colo.

OBITUARY

Dr. William G. Ebersole

DR. WILLIAM G. EBERSOLE was born in Carrollton, Ohio, November 18, 1864. His early education was received in the local schools of that community. Dr. Ebersole spent some six years of his life in the business world, during which time he became acquainted with the dental profession, and saw from the layman's viewpoint a great field for humanitarian dentistry. With this ideal ever before him he sought further education, attending Ohio Northern University and Western Reserve University. From the latter he was graduated from the dental school in 1895, and from the medical school in 1896. After entering his active professional life he became more and more absorbed in the public health phase of the profession. He served as chairman of both the local and national committees on oral hygiene, and later became secretary-treasurer of the National Mouth Hygiene Association, which was really a creation from his dreams of public service.

The dental profession has had few men who have devoted their time, thought and energy, even life, to the ideal of teaching and helping the children to appreciate and practice mouth hygiene, as did Dr. Ebersole. So earnest and vigorous was he in prosecuting his ideals that many called him a hobbyist and a dreamer. He dreamed, yes, and then worked day and night to realize his dream. To him more than to any other one man do we owe the advance of the oral hygiene movement. He established mouth hygiene in the Cleveland public schools, and there are today in these schools outfits placed there through his efforts that bear silent witness to the value of his dreams, for they are now in service every day.

Dr. Ebersole wanted to teach the children to so use and care for their mouths that they would not suffer the pain of dental lesions. This man exerted himself beyond human ability to endure in his struggle to make real his ideals. Finally his health broke and for more than ten years he has not been a well man; but no one ever heard him complain. He was always hopeful and cheerful during all the operations he was compelled to undergo. Though his years were less than some, he lived much more than most men, if we count life by good deeds accomplished.

Besides his family he leaves a host of friends who will remember him to the end of their days. His last illness was of short duration. The end came as a surprise to most of us. Dr. Ebersole passed beyond just after midnight, October 6, 1920.

H. R. C. W.

SUGGESTIONS

Conducted by F. R. Chapman, M.S., D.D.S., Columbus, Ohio

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

Preparing Roots

In cutting down roots to receive crowns, first place a rubber band over tooth up to gingival; this will force the gum away and give a clean view of end of root.—*Gordon C. Barkley, Commonwealth Dental Review.*

Sugar and the Teeth

Dr. Wheatley, the county and school medical officer for Shropshire, produced a record of investigations in the elementary schools of that county showing that the restriction of the sugar supply during the war, the altered character of the bread, and the reduced consumption of milk, had been accompanied by a remarkable diminution of dental caries.—*London Times* per *Oral Hygiene.*

Pulp Capping Dressing

Equal parts of thymol and acetone, if applied directly to exposed pulps and covered with two coats of varnish, which are permitted to dry serially, will make a useful application and protection before applying plastic cement filling.—*Herman Prinz, Dental Register.*

To Take Modeling Compound from Impression Trays

Boil for fifteen minutes in a solution of six parts water to one part carbonate of soda. This will leave the trays clean and bright.

—*B. McMillion, Dental Facts.*

To Sterilize Modeling Compound

I note in your magazine that a correspondent asks for a method of sterilizing modeling compound in order that it may be used again. This can be accomplished by putting the old compound in a clean receptacle which will fit into an ordinary vulcanizer, having the vulcanizer thoroughly clean; seal vulcanizer and raise to a temperature of 212 degrees for a period of fifteen to twenty-five minutes. Compound will be slightly harder, but not spoiled, as it would be from boiling. This method is not original, but appeared in some magazine in the past few years.—*H. Clay Hassell, Dental Digest.*

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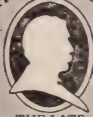

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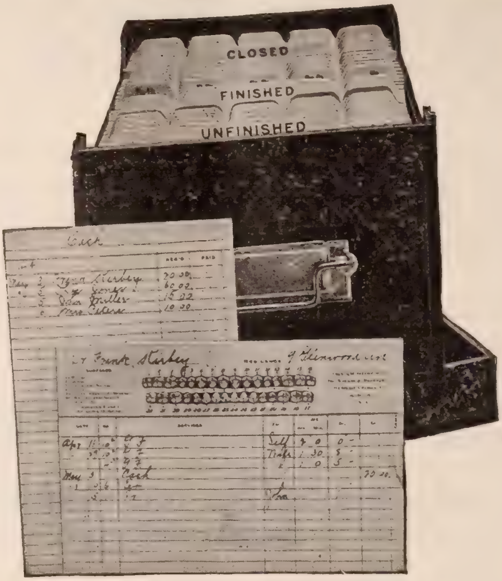

The Bannister Dental Card System consists of three Guide Cards of three distinct colors, one printed "Unfinished," one "Finished" and one "Closed;" three sets of 40-division Alphabetical Index Cards of colors corresponding to the Guide Cards, 15 Cash or Bill Cards, 300 White Record Cards, and a containing box with an adjustable follower.

The system is simplicity itself. A new account is opened by writing the patient's name and address in the places for them, registering the work done, and if more work is to be done at a future time, placing the record card in its proper place in the alphabet index back of the Guide Card marked "Unfinished," when work is all completed, but not paid for, the card is transferred to the "Finished" alphabet index, and when paid for to the "Closed" index.

The Cash and Bill Cards are for keeping records of cash received and the bills sent to patients. Sample Cards and full description sent on application.

Prices	The Bannister Dental Card System No. 1, complete with Record Cards, ruled one side only, in Case, (shipping weight, 6 lbs.)		$6.50
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NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

The Dental Hygienist

If we believe that "nearly all abdominal surgery can be traced to *mouth* infection," also that "the next step in preventive medicine would have to be taken by the dentist," then we should *act* as we believe.

The questions thrust upon us are, *how* shall we take the next step? *How* can we cope with such an enormous problem?

It needs no argument to convince a reasonable mind that forty thousand dentists cannot take adequate care of the mouths of one hundred and ten million people. They cannot do even the repair work necessary, much less attend to the therapeutic and hygienic treatment needed. The conclusion is inevitable that we must enlist other aid. Here is just where the dental hygienist fits in.

No sane person would demand that the physician should nurse his patients back to health as well as attend to his multitudinous other duties. It would be preposterous. Therefore, the medical nurse was provided as an aid to the physician. It is just as absurd for anyone to expect the dentist to do all the prophylactic work required in restoring the human mouth to an aseptic condition.

No sane person would insist upon it.

Herein lies, in a nutshell, the shortsightedness of all the anti-dental hygienist arguments.

It is just as rational to have dental as medical nurses.

Anyone who rightly understands the situation ought not to object to the entrance of the dental hygienist into the movement for the promotion of oral hygiene, providing, of course, that suitable safeguards are placed around the vocation, just as proper limitations have been put upon the functions of the medical nurse.

These safeguards are now being devised and put in force by an intelligent, enlightened and progressive people all over the civilized world.

The Empire of Japan has taken steps which are in some respects far in advance of our own.

The vast British Empire, which includes over thirteen million, one hundred twenty-three thousand, seven hundred and twelve square miles, has been hard at work upon this problem for many years.

Australia, Canada, Nova Scotia, Scotland and England, are noticeably advanced in the hygienic movement.

In the United States twelve states have recognized the dental hygienist legally, with five more states agitating the passage of similar legislative enactments during this year and others seriously considering taking the same step.

The Federal Government at Washington, D. C., has endorsed the dental hygienist by instituting Civil Service examinations for them, and the Surgeon-General of the United States employs dental hygienists in his service.

What more do you want to establish the status of the dental hygienist?

The *proofs* of the *magnitude* of the movement for the *prevention* of *disease* in which the dental hygienist is destined to become a potential force, are presented daily before the person who has eyes to see, ears to hear, and a brain to think.

The *evidence* of the *enormity* of the *work* to be performed by the dental hygienist is apparent every time a person opens his mouth to speak or use his teeth to eat.

Prophylaxis strikes at the fountain-head of human ills physically, and the sooner the fact is recognized alike by the professions and the public, the better it will be for mankind in the struggle for existence, the race for efficiency, and the competition for supremacy.—*Alphonso Irwin, D.D.S., Camden, N. J., in Oral Hygiene.*

Dr. Glenn Crim, Shoals, Indiana, and Dr. S. F. Campbell, of Davess county, Indiana, have opened dental offices in three cities in India, Lucknow, Cawnpaur and Naini Tal. They are the first American dentists to establish themselves in that part of India. The three cities contain a population of about a million.

The British Columbia Dental Supply Co., Vancouver, suffered heavy loss by fire, September 2.

All colleges have opened with the largest enrollment in history. Seems that some effort is being made to supply the crying need for dentists, made more acute by lengthening the school term.

The New York college of dentistry treated over 25,000 patients during the past twelve months, charging for materials only. Over 4,000 radiographs were taken.

"All auto-owners are not fools, but every fool owns an automobile."—*Andrew Carnegie.* Ever notice it?

From Chicago (!) comes the story of a dentist, Dr. F. A. Fahnestock, who has practiced since 1868 in the same office, 1802 South State street, and in all that time has had his rent raised just $4.00 per month. Seems that there are still some of old-fashioned humanities left in the world after all.

Dr. Alfred Gysi, of Zurich, Switzerland, has been visiting prominent cities in the United States, addressing dental societies. He was under the chaperonage of Dr. George Wood Clapp, of the Dentists' Supply Co.

Years ago before airplanes were deemed possible, Dr. Gysi constructed an airplane which would fiy around a large rectangular court of his home and return to his hand.

"My family began to suspect insanity and remonstrated so thoroughly that I gave up my studies of the airplane," he said.

The son of a famous instrument maker, Dr. Gysi once needed a microscope. He melted glass into a globule and then ground it to answer the purpose. He attended medical schools and dental colleges in Switzerzland and then came to America and was graduated from Pennsylvania Dental college in Philadelphia. He returned to Switzerland as a professor.

Dr. Gysi did not confine his activities to dentistry. He invented a graduated ray filter, which is now extensively used in photography, a subject on which he is an authority. His latest inventions include a pipe noted for its lack of tongue biting. It has a smoke tube fifteen inches long in a very short stem and is constantly used by the noted dentist.

"Since man must smoke, why not do it to get the most pleasure out of the undertaking," he explained.

Rochester Hygienists' School Opens

The fifth session of the Rochester, N. Y., Dental Dispensary's School for dental hygienists has been opened with an enrollment of fifty-three young woman students, according to an announcement made by Dr. Harvey J. Burkhart, director. Heretofore two short courses have been given each year in the school but with the beginning of the present session the course will be of one year's duration with the probability that within a short time it will be extended to two years.

This school for dental hygienists is the first of its kind organized by the legal authority of any state in the country. The aim is to educate young women to do prophylactic work in dental offices, schools and public institutions. Facilities are provided for careful training and instruction in the various branches taught. The school enjoys a splendid reputation all over the country, attracting students from nearly every state. Of the present class all but twelve come from outside Rochester.

With the enactment of the law making possible a school for the instruction of young women in oral prophylaxis, a new avenue of employment was opened to them. The opportunities for engaging in a work that will be agreeable, helpful and remunerative have induced many young woman to engage in it. The compensation is said to be much better than that received by young women in other callings. About twenty graduates of the school are doing prophylactic work in the public schools of Rochester and their services are receiving the approval of the school authorities.

Demands for the service of the graduates are said to be greater than the supply. Dr. Burkhart said that he had on file applications from dentists, school boards, Red Cross chapters and hospitals for dental hygienists far in excess of the number he is able to supply.

"Young women taking the course are practically assured of positions the moment they are ready to take them," he said.

A fund of between $30,000 and $40,000, to establish a scholarship at the University of Pennsylvania Dental School for Graduates, of some Australian university, has been raised by Pennsylvania alumni living in Australia.

Grows His Third Set of Teeth at Age of 108

"Uncle" Jack Terry, 108 years old, a resident of the eastern part of Union county, near Ripley, Miss., and all of whose brothers and sisters lived to be at least a century old, has cut his third set of teeth. Uncle Jack, however, says the new teeth are of little value to him, as they are so easily broken.

Columbus, Ohio, September 18.—A waiting list has been established at the college of dentistry of Ohio State University. Dean Harry M. Seamans announced yesterday that equipment for ninety-three students had been set up at the Park street laboratories, and in many cases the students would be forced to double up.

The university authorities have advised all those not able to get into the college of dentistry this fall to enter the college of arts and place their names on the waiting list.

Supplee & Co. Cleverly Robbed

New York, September 30.—In the discovery yesterday of a $20,000 robbery in the laboratory of Samuel G. Supplee & Co., there came to light a new species of robbers, namely, those who bring their necessary tools to the place a day or two before they are ready to begin operations. In this instance the intruders brought two tanks of acetylene, which they subsequently used in burning out the front of a large safe in the Supplee & Co. office some time between Saturday afternoon and yesterday morning.

Investigating the robbery, Captain McQueeney of the third detective district learned that late Saturday afternoon two unidentified men carried two tanks into the building, telling the superintendent that the gas had been ordered by the Cuthbertson Contracting Company, with offices on the seventh floor of the building. As the Cuthbertson office was closed for the afternoon, the superintendent was unable to verify their statements, but their positiveness caused him to premit them to leave the tanks in the hallway. The two men left, saying they would return Monday morning for the receipts.

The police believe the men concealed themselves in the building and waited until every one had gone when they carried the tanks to the next floor and into the dental supply office. Here they attached the torch and worked with comparative safety.

According to Samuel G. Supplee, the robbery was discovered yesterday by one of his clerks whose duty it was to arrive earlier than the rest of his employes. The clerk found the door of the safe completely burned from its hinges and the interior in disarray. In addition to about $5,000 in cash and Liberty bonds, the intruders stole a quantity of gold

Carmi Lustro Polishing Powder

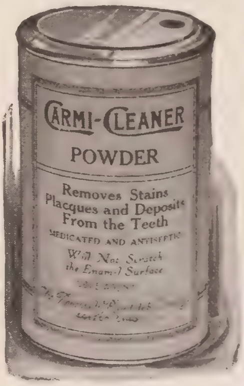
A medicated antiseptic, non-abrasive Polishing Powder, the first material ever offered for restoring the brilliancy to tooth enamel, no matter how lost.

Polishes Without Wearing

Works by friction, not by abrasion. Restores highest brilliancy without injury to teeth.

Prices in U.S.A., Effective July, 1919, Small size, $0.65 Large size, $1.25 Subject to change without notice.

Use Carmi Cleaner, powder and paste for cleaning teeth; Carmi Lustro for restoring natural polish.


CARMI-CLEANER
POWDER
Removes Stains Placques and Deposits From the Teeth
MEDICATED AND ANTISEPTIC
Will Not Scratch the Enamel Surface

Carmi Cleaner Powder

A medicated antiseptic Cleaning Powder, in successful use for many years. Quickly removes infectious matter and all stains, leaving a smooth, unabraided surface, ready for polishing.

For Home Treatment

In Pyorrhea, should be dispensed by dentist for use three times daily for several days before scaling. Frees teeth and gums from clinging, putrescent debris, which is thrown out when mouth is rinsed. Ideal for cleaning artificial dentures.

Prices in U. S. A., effective July, 1919, subject to change without notice. Small size $0.65, Large 7 oz. size, $1.25 3 pound can, $6.00.

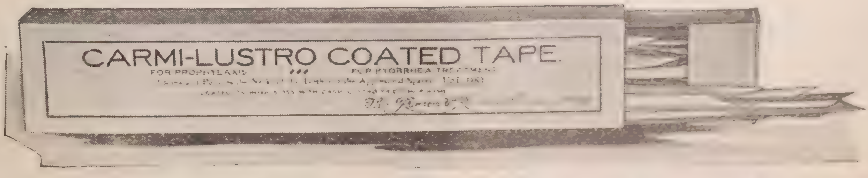
A Cleaner—not a Polish. Use Carmi Lustro Polishing Powder for restoring luster to enamel.

PREPARED
Cork Polishing Wheels
Specially adapted and very effective for use with
CARMI LUSTRO
SOLE AGENT
The Ransom & Randolph Company
TOLEDO OHIO
Directions on bottom of Box

Cork Polishing Wheels

Designed for and best adapted to the use of Carmi Lustro Polishing Powder. The powder adheres well. The wheels are of high-grade cork and will be found very durable.

Price, per box of about six dozen $0.65



Especially prepared for cleaning and polishing the necks of the teeth. It is indispensable in prophylactic and pyorrhea treatment. It is an unwoven fibre composition, heavily coated with Carmi Lustro Polishing Powder, which will impart as high a luster as the Carmi Lustro Powder applied with the Cork Wheel. Ends are pointed to allow easy passage between the teeth.

A valuable unit in the Carmi Lustro Outfit. Price, in U.S.A., in effect July, 1919, per box, $0.65.

Order from your dealer. New literature free on request

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TOLEDO, O. U. S. A.
CLEVELAND GRAND RAPIDS FLINT COLUMBUS

and platinum worth $15,000 at present market values. Mr. Supplee said the burglars apparently used gloves in their operations, as there were no fingerprints in evidence. He said he was without a clue to the thieves. Other manufacturers of dental supplies and manufacturing jewelers in the building were wondering why the thieves had not entered their offices. It was probably due to the fact, one of them believed, that the burglars used up all of the gas in the two tanks in opening the Supplee safe.

College of Dentistry, University Southern California, Los Angeles, opened with an enrollment of 400—172 freshmen.

Interesting specimen of Etruscan dentistry is now in the civic museum at Corneto of the Necropolis of Tarquinii, Italy, and consists of three teeth, or, more properly, four abutment attachments and three supplies, the attachments being gold rings and the teeth supplied being the central incisors and bicuspids. The two central incisors are made from a single ox tooth grooved down to give it the appearance of two upper central incisors.

Athens, O., October 15.—A. W. Barker, 73, is cutting a new set of teeth. Several weeks ago he cut a new molar and he reports two more about to break through. Virtually all of the old man's original outfit of masticators are gone and he hails with delight the promise of a new set.

"I'd like to get 'em or enough of the new set before the corn on the cob season is over," he said. "Hope they hurry."

Thieves Busy Again

Jamestown, October 11.—Five hundred dollars' worth of gold and platinum was stolen from dental offices entered by burglars Saturday night. The dentists robbed were Paul A. Camp, Chadokin building; R. G. Roberts and Ray J. Walkerman, Roberts building; Harry J. Stuart, Roberts building; Nels Johnson, Main and First streets; R. L. Linbeck, Bank of Jamestown building, and C. H. Nelson, Professional building. The losses to each varied from $25 to $150.

Findlay Clinic to Continue

Findlay, Ohio, October 12.—The board of education at its regular meeting Monday evening at the central high school building, entered into an agreement with the Findlay dentists providing for this year's dental clinic in the public schools.

The clinic will be conducted in the same manner as in the last four years, it was agreed. Dr. Merlin Miller will again be the dental operator, while Dr. J. H. Boger will again act

The No-Ratchet Operating Stool

relieves feet and legs from all body weight

yet need not be sat upon in the heavy relaxing sense. Merely leaning against it relieves legs and feet of the dead weight of the body, and prevents that downward, debilitating drag upon the entire physical organism reduced to its last extremity by fatigue. Keeps the body in good condition late into the evening when necessary, lengthening the day, increasing earning power. No sensible man can fail to be pleased with the disappearance of that "played-out" feeling so common under ordinary conditions.

Price, regular height in regular stock finish, $32.00

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as dental supervisor. Dr. E. C. Miller was named a member of the board of control for the next year.

Clinic activities will be started immediately it is understood, official action of the board only being awaited.

Members of the board last evening in statements reaffirmed their belief in the good accomplished by the dental clinic in the years it has been in operation in the local schools.

"It is indispensable," declared president W. E. Crates in discussing the matter.

Wanted

I am forming a collection of badges used at the different Dental Conventions, National, State, or Local; also, past and present.

Fraternity pins, buttons, or badges also are desired.

This collection will be beautifully mounted and presented to some Dental Museum.

Any contribution sent to me by members of our profession will be appreciated and acknowledged.

Yours sincerely,
THADDEUS P. HYATT, *Dental Director.*
℅ Metropolitan Life Insurance Co.,
New York City

Eastern Ohio Meeting

Steubenville, Ohio, October 3.—The Eastern Ohio Dental Society convened here on Thursday, with about forty dentists in attendance. Following lunch at the Hamlie M. E. Church at noon, a business session was held at the Y. M. C. A., after which interesting addresses were delivered by Dr. E. W. Martindale, of Ohio State University and J. W. Newell, of Cambridge. General discussion followed these addresses and a suggestion that a study club for local dentists be organized, met with approval and a meeting is to be held next week for that purpose. L. B. Patterson, president, presided.

Defiance Dentist Practiced Forty Years

Defiance, October 12.—Dr. S. A. D. Potterf, one of the leading dentists of this district, was honored by the Maumee Valley Dental Society at its annual meeting held here today.

The occasion was the fortieth anniversary of practice in dentistry by Dr. Potterf. He served as president of the society for several years, and at the present time is recording secretary. N. A. Cunningham is present president.

The meeting opened at 10:00 A.M. L. L. Sheffield, Toledo, giving a paper on Tench method impressions, followed by Dr. Potterf who spoke on reminiscences of forty years' practice. C. M. Neizer, Ft. Wayne, closed with an address on dental jurisprudence.

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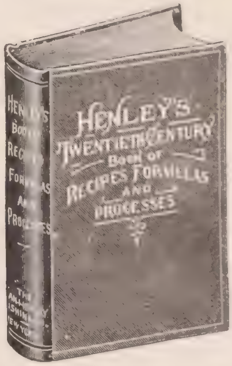
Ever Offered to the Public
1920 EDITION—JUST READY
Henley's Twentieth Century Book of
RECIPES, FORMULAS
AND PROCESSES



10,000 TRADE SECRETS
PRACTICAL RECEIPTS
CHEMICAL PROCESSES
SCIENTIFIC FORMULAS

HOW TO MAKE EVERYTHING
FOR THE HOME, THE FACTORY
AND THE WORKSHOP.

Antiseptics, Waterproofings, Lubricants, Rust Preventatives, Dyes, Filters, Cleaning Preparations, Enameling, Beverages, Inks, Adhesives, Polishes, Disinfectants, Flavorings, Cosmetics, Ceramics, etc., etc.; how to make fly paper; to color flowers artificially; to estimate weight of ice by measurement; to make materials fireproof; to work with metals—aluminum, brass, etc.; to make anything and everything, from A to Z.

THIS IS THE BOOK
every one who seeks PRACTICAL, ACCURATE KNOWLEDGE and guidance in his everyday work MUST HAVE at his command.

It is a money-maker and a money-saver; it appeals to the young as well as to the old. Great business enterprises owe their success to the manufacture or sale of simple inventions or compounds, usually the results of an experiment at home. One woman writes; "I am supporting myself and two small children from the sale of toilet articles I put up by following directions in your book."

Profit by the knowledge that has made others successful. GET THIS BOOK TODAY.

Price $4.00

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THE DENTAL SUMMARY
TOLEDO, OHIO
Drawer 906

Northern Indiana Meeting

The beautiful little city of Marion entertained the Thirty-First Annual Convention of the N. I. D. S., October 6-7, in a most hospitable and acceptable manner. The attendance was very good, while the interest shown in the program was strikingly close.

The entire time of the convention was occupied by G. Walter Dittmar, of Chicago, assisted by C. A. Nixon, of Valparaiso, Ind., the subject being, "Cast Attachments to Vital Teeth."

The officers in charge of the meeting were: Lew W. Dailey, Bluffton, president; W. S. Walters, West Lafayette, vice-president; A. L. Harter, Kokomo, secretary; C. A. Nixon, Valpariaso, treasurer; F. B. Garner, Muncie, registrar; N. W. Hiatt, Marion, superintendent of clinics; C. A. Priest, Marion, master of exhibits.

An American Hall of Fame

Frank Abbott, M.D., D.D.S., formerly of Johnstown, N. Y., has been nominated for a place in the American Hall of Fame.

Twenty years ago, in 1900, a gift of $100,000 to New York University made possible the building of a colonnade on University Heights, overlooking the Palisades and the Hudson and Harlem River Valleys, the exclusive use of the colonnade and its substructure to serve perpetually as the Hall of Fame for great Americans. One hundred and fifty panels are provided for memorial bronze tablets, each to contain the name of some American.

Each five years the Senate of New York University invites nominations from the public during the months of March and April, the nominations to be closed by May first. The final list of nominations when published contains also the nominations made by the Senate itself and by the electors, the latter consisting of one hundred representative Americans, selected from university and college presidents, scientists, historians, authors, jurists and public officials. Fifty tablets were to be inscribed in 1900, and every five years thereafter five additional names were to be chosen so as to complete the entire number by the year 2000 A. D.

No man is eligible for nomination to the Hall of Fame until ten years after his death. It has been widely noted and commented upon that thus far no medical man has been elected to the Hall of Fame.

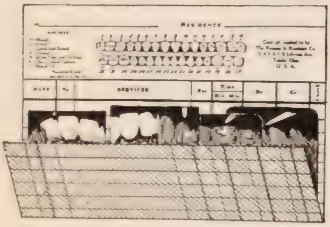
Dental Society Meetings—1920

STATE SOCIETIES

November—18, District of Columbia, George Washington University, Washington, D. C.; Arizona, Phoenix.

December—2-3-4, Ohio, Columbus; 10, Delaware, Wilmington.

Dates to be announced — Arkansas, Little Rock; California State; Louisiana, New Orleans; Montana, Great Falls; Oregon, Portland; Washington, Tacoma.



Bannister Record Card No. 3

Something New

For Filing X-Ray Films

This new member of The Bannister System bears the same engraved and numbered set of Teeth, is ruled both sides precisely the same as the regular No. 2 Card, but differs in being longer, and the lower end scored and folded as shown, forming a pocket which

Makes Filing Easy

A most convenient and satisfactory device for the purpose, avoiding the necessity of having a special file for the films, and preserving them where wanted, in connection with the record of the case to which they apply.

Fits the Regular Bannister Filing Case

Card is salmon color, contrasting with other cards, for easy selection from file.

Price, per pack, 50 cards, $1.50

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U. S. Public Health Service

DENTAL EXAMINERS APPOINTED BY THE BUREAU OF WAR RISK INSURANCE

Cheboygan county, Mich., Dr. A. E. Sangster, Cheboygan; Rome, N. Y., Dr. Harold E. Dorn; Red Lake county, Minn., Dr. A. E. Lucian, Red Lake Falls; Yonkers, N. Y., Dr. Victor A. Martin; Alta Vista, Ia., Dr. L. A. Kieren; Greene county, Ohio, Dr. E. J. Reynolds, Xenia; Mercer county, Ill., Dr. W. W. Moorehead, Aledo; Hibbing District, Minn., Dr. Wilbur Wring, Hibbing; Delaware county, N. J., Dr. Leroy D. Neish, Walton; Wood county, Ohio, Dr. T. M. Lea, Bowling Green; Litchfield district, Minn., Dr. A. C. Nelson, Litchfield; Davies county, Ky., Dr. O. B. Heavrin, Owensboro; Fulton county, Ind., Dr. Perry Heath, Rochester.

DEATHS

Dr. Samuel Bartlett Short died at his home in Elkhart, Indiana, September 29, 1920. Dr. Short was a graduate from the Dental Department of the University of Michigan, in the class of 1879. He enjoyed a lucrative practice for many years. Because of ill health he retired from active practice about five years ago. Dr. Short is survived by his wife, Mrs. Emma M. Short.

At Evansville, Ind., August 30, Dr. W. H. Stonecipher, formerly of Corydon, aged 68.

At Newton, Mass., September 17, Dr. C. W. Bradley, aged 70.

At Hartford, Conn., September 18, Dr. David Goldstein, aged 28. Suicide by shooting.

At a hospital in Plainfield, N. J., September 25, Dr. Daniel Easton, of Washington, D. C., aged 72.

At Lansdale, Pa., October 1, Dr. Jacob E. Boyer, aged 72.

At Old Forge, N. Y., October 1, Dr. Joseph F. Gaffney, aged 37.

At Newington, Conn., September 29, Dr. Louis Jehl, formerly of New York City, aged 75.

At Springville, N. Y., September 27, Dr. Sewell Glazier, aged 73.

At Norwich, Conn., October 1, Dr. George H. Commeau, aged 55.

At Camden, N. J., September 22, Dr. Byron E. Fortiner, aged 50.

At New York, October 11, Dr. Morris Chaim, aged 81. He was one of the charter members of the First District Dental Society.

At Boston, October 14, Dr. Alfred H. Gilson, of Quincy, aged 66. He had been active in dental society matters and in politics for many years.

At Utica, N. Y., October 14, Dr. A. H. Lee, aged 60.

At Sacramento, Cal., October 6, Dr. Frederick H. Keseter, aged 48.

Classified Advertisements under this heading, $2.00 each for 60 words or less; additional space, 2 cents per word, single insertion; three insertions or more, special rate on application.

FOR SALE—Akron Dental office. Two chairs. Established. Address, 1110P, care The Dental Summary.

WANTED—December first I will be in need of an operator, for an ethical practice. Give age, married or single, if married how long, year of graduation, school graduated from, what post graduate work if any, what branch of dentistry do you prefer? This position in Seattle, Wash. Address, 1120C, care The Dental Summary.

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NEW TYPE STERILIZER

Heating Element and bevel faced three-heat switch are securely fastened to a metal reinforced bed plate with

Transite Heat Conserver—
Brazilian Mica Insulation—
Nichrome Ribbon Heat Unit—
Asbestos Covered Wire Connections—
and Original Safety Features.

All specially designed for durability, service and quick action.

Send for descriptive circular o, different sizes and models

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SAL HEPATICA

MATERIALLY AIDS
Local Treatment in
PYORRHEA

Bristol-Myers Co.
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O. S. D. S.

Fifty-Fifth Annual Meeting

Memorial Hall
COLUMBUS

November 30, December 1, 2, 1920

One Week Earlier than Usual

DON'T FORGET!

Denture Construction
Partial Dentures
X-Ray Interpretation
War Oral Surgery

Fifteen-minute Papers on Timely Subjects

Many able men will be there, including
DR. H. E. FRIESELL, President National Association

CLINICS—Three Half-day Periods

SOMETHING NEW—Manufacturers' Clinic Wednesday

Make Hotel Reservations NOW—It'll be chilly sleeping in the parks!

O. S. D. S.

REGULAR CONTRIBUTIONS

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XL December 1920 No. 12

THE CAST-SWEDGED GOLD BASE

BY DAYTON DUNBAR CAMPBELL, D.D.S., KANSAS CITY, MO.

SPECIAL LECTURER DENTAL PROSTHESIS, KANSAS CITY WESTERN DENTAL COLLEGE;
FOUNDER AND PRESIDENT OF CAMPBELL SCHOOL OF PROSTHETIC TECHNIC

THE GOLD BASE DENTURE is second only to the platinum base continuous gum denture. When esthetic requirements of the case do not make the porcelain gum imperative, gold base dentures satisfy every demand, except for the individual whose sense of well-being prompts him to insist upon having the *ne plus ultra* of prosthetic art.

In addition to the thermal stimuli afforded by the gold base denture it is characterized by the ease with which it may be kept clean; it does not quickly tarnish, and further, because of gold's greater specific density it may be made much thinner than one of aluminum. The prosthetist often will find that a prospective wearer of gold base dentures may view their weight as an objectionable feature and on this account may hesitate in deciding upon them. He will do well to keep in mind and advise his patient, that, since the upper jaw has no sense of weight, the weight of an upper denture would be objectionable only when it is so pronounced as to tire the muscles at the back of the neck which, of course, never occurs. The writer never has known of an instance in which the weight of an upper denture was responsible for its displacement. It may be observed, however, that this sense of weight is not lacking in the lower jaw, and consequently a lower base constructed of Watt's Metal or Weston's Metal often may be too heavy to be worn. An attempt to aid retention through adding weight to the lower is prompted by fallacious reasoning or by an incomplete survey of the facts. Several years ago the late Dr. Haskell demonstrated in his own mouth, that the tongue possesses sufficient strength to displace any lower denture regardless of its weight; he also called attention to the undesirable character of a weighted lower because of the annoyance resulting from its displacement while the patient is asleep or in a recumbent position. A lower gold base never possesses enough weight to arouse objection on the part of the patient or to provide an undesirable factor in retention.

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*This is the eleventh of a series of twelve articles being written by Dr. Campbell, especially for the 1920 volume THE DENTAL SUMMARY.

*EDITOR'S NOTE: Discussion of the principles or methods presented in this series of articles on Prosthetic Dentistry will be welcomed by the author. All correspondence in this connection should be addressed to Dr. Dayton D. Campbell, Shukert Building, Kansas City, Mo.

In our article last month on "The Cast Aluminum Base," we presented the direct method of casting in which the pattern is conformed to the duplicate cast, and pattern and cast are invested together. The method employed in casting aluminum bases may be followed with equal success in the casting of gold bases, except that the wax should be much thinner and the sprue opening a mere slit in the investment. The reduced sprue opening is necessary to prevent the molten gold from falling through before it is fully ready to cast.

The cast to which the gold base is to be adapted should be poured of Spence's Plaster Compound or of Weinstein's Calsilith in order to secure the strength required during the swedging process. It may not be superfluous to mention again the fact that for swedging purposes the thickness of the cast should be approximately the same as its length or breadth. When a relief is indicated it may be supplied by means of physicians' adhesive tape cut to proper size and shape; this is sealed to the cast with a minimum amount of hot wax from the spatula. As a precaution to prevent the wax sheet of the pattern from sticking to this wax when the indirect method of casting is followed, the relief may be oiled very lightly, using white vaseline for this purpose.

THE INDIRECT METHOD

When the cast has been provided with a relief and this has been oiled as suggested, a sheet of Kerr's Casting Wax, No. 28, is warmed by holding between the palms of the hands; during the winter months it is often advisable to place both cast and wax in warm water in order to facilitate adaptation without danger of sticking; warming the wax increases its adaptability, while saturating the cast minimizes adhesion. The wax sheet is adapted to the cast by means of fingers and tongue, exercising caution to avoid stretching or breaking the sheet. During this process the wax should be removed once or twice to eliminate danger of sticking to the cast when the pattern is finally completed; if the cast has no pronounced under-cuts the pattern may be removed without difficulty. In cases presenting deep under-cuts, the pattern may be removed through slightly bending out the wax at these points sufficiently to disengage it—compensating through swedging for any distortion that may occur at this stage in the construction of the pattern. By submerging the cast and pattern in cold water the operator may avail himself of the action of capillary attraction through which the water will separate the cast and pattern without the difficulty that sometimes may be experienced in using the fingers alone. The separation will be facilitated through allowing a stream of water from the faucet to play upon the submerged cast and pattern, thus driving the water in the direction already taken by it as a result of capillary attraction. After returning the partially completed but already well adapted wax pattern to the cast, the surplus wax that has been allowed to remain in order to facilitate removal, is trimmed away with a sharp knife blade which is moistened and warmed by holding momentarily in the mouth. In trimming the periphery the operator cuts the wax either at the extreme outer edge of the roll, or half way between this outer edge and the crest of the ridge, depending upon whether he desires the border of the finished denture to be of gold or vulcanite.

Using the No. 1 nozzle of the Mathew's Sprue Gun shown in our article in the November issue of THE DENTAL SUMMARY, a wax wire of approximately 18-gauge is obtained for providing a definite contour on the palatal surface. The position and size of the tuberosities determine very largely the position this wire shall assume in cases which reveal any degree of esthetic appreciation on the part of the operator. The beauty of the case will be greatly enhanced through a careful designing of this border and this, too, without in the least minimizing the practical value of the denture. This wire usually is placed too far below the ridges, because the average operator is fearful that it may interfere with the subsequent alignment of the teeth and consequently places it entirely too far from the crest of the ridges. In *Fig. 1* the wire on the left appeals to the writer because of its carefully contoured effect; the one on the right is angular and shows little evidence of

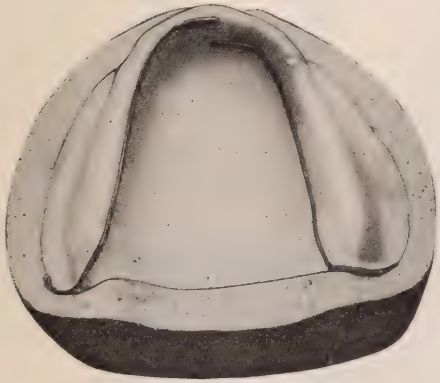
Fig. 1

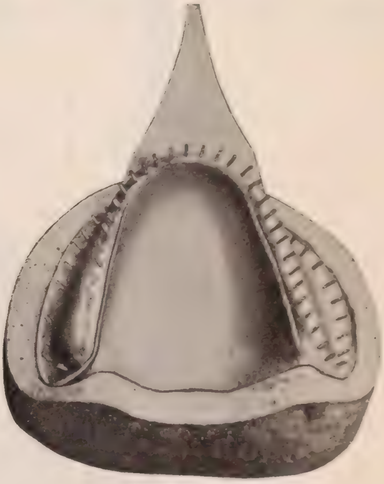
Fig. 2

Fig. 1—The wax wire on the left border of this pattern appeals to the writer because of its more graceful contour.

Fig. 2—Wax pattern with spine-like attachments. After casting, each of these is melted down with blow-pipe; the resulting ball very greatly incereases retention of the vulcanite.

design. This border wire of the palatal surface is allowed to extend directly over the tuberosity and beyond, until it terminates in the posterior buccal border. There is no benefit derived through permitting this wire to continue along the peripheral border of the base; on the contrary, this should not be permitted, because, when it occurs, the rigidity of the border is increased until it interferes with close adaptation at the time of swedging.

ATTACHMENTS FOR THE VULCANITE

After placing the palatal border wire in position it is sealed along the inner or palatal edge with a minimum amount of wax and the outer edge is left untouched. With the 18-gauge wax wire, retainers are made for attaching the vulcanite. These are made by holding the wax wire against the pattern and touching both pattern and wire at point of contact very lightly with a hot spatula; this attaches the wire and it then may be severed at the desired length with the next movement of the spatula. These should be placed at intervals of three millimeters along the inside of the ridge just outside of the palatal border wire, and also close along the peripheral border, allowing just space enough for finishing. (*Fig. 2*). The wisdom of supplying these retainers in large numbers is verified by the results of several years of experience during which the number has been increased very greatly. Their value is also greatly increased through the use of the blow-pipe after the base has been cast; this method will be described in a later paragraph of this article.

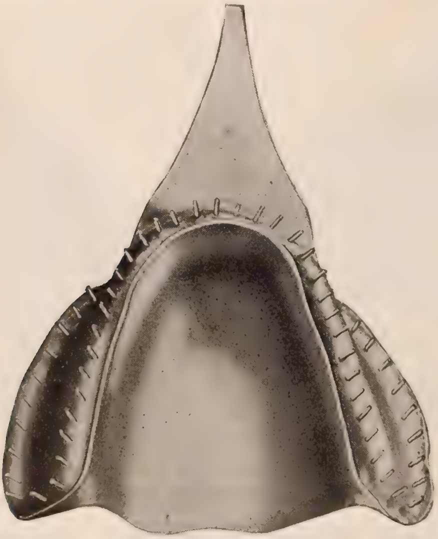

Fig. 3—Wax pattern removed from Spence Cast ready to invest.

In making the sprue, a strip of the No. 28 Kerr's Sheet Wax about an inch in width is shaped at one end to conform to the anterior portion of the wax pattern, while at the other end it is shaped to the point of a triangle. The contoured end is now attached to the pattern. In the case of the lower the sprue is attached to the pattern along the labial or buccal border at any point which adds to convenience in investing.

The pattern is removed for the last time and placed in cold water while the investment material is being mixed. The investment formula is the same as that followed in investing for aluminum bases, namely: white lake sand, 3¼ pounds; cast plaster, 2 pounds; silex, 1¼ pounds. This formula may be varied slightly if desired, keeping in mind that the binder of all investments, plaster, may be increased in quantity where the heat is not sufficiently high to disintegrate it. A larger amount of sand reduces the time required in the drying-out process. Silex,

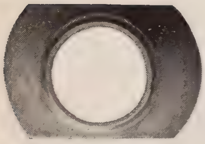
Fig 4A

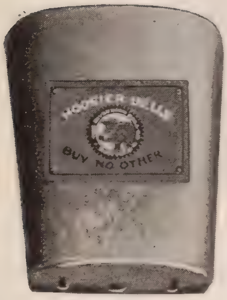

Fig. 4B

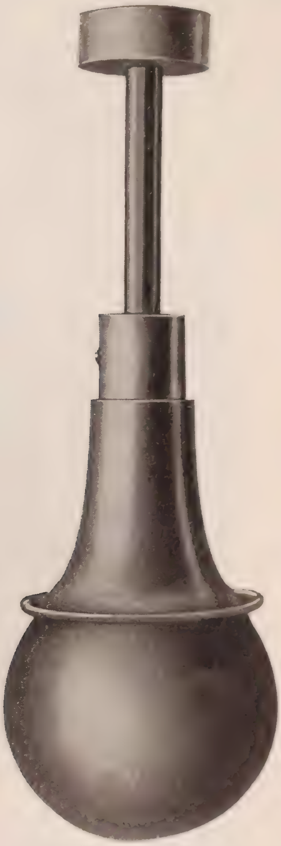
Fig. 4C

Fig. 4A is crucible former.

Fig. 4B is the No. 4 Hoosier Cow-Bell Flask. The openings left through strap and clapper allow escape of air in casting.

Fig. 4C is Casting Horn. This horn was originally a part of the Schweitzer Casting Machine.

like sand, is also heat-resisting and makes a smoother casting. Dr. George M. Hollenback, of Los Angeles has demonstrated the feasibility of casting with the use of plaster alone, provided unusual precautions are taken in heating the flask.

INVESTING

A sufficient amount of the investment is mixed and a brush is employed to paint the intaglio full as the pattern lies in the palm of the hand. It is then turned over and the other side painted in like manner, care being exercised to avoid air bubbles and to avoid disturbing the spine-like attachments. The No. 4 Hoosier Cow Bell which is used as a flask, is filled about two-thirds full and the investment-covered pattern is then laid gently upon the side of the bell as it is tilted over to receive it; the bell is jarred gently and brought to an upright position as the pattern gradually is submerged. More investment is poured in until it is piled up above the mouth of the bell flask; the brass crucible-former shown in *Fig. 4a* is pressed down over the sprue, the excess investment is wiped off around the edges of the crucible-former and the flask allowed to stand until the case has set. The inner surface of the crucible-former should be kept well polished and it also may be lightly oiled with vaseline each time before using in order to facilitate its removal. Immediately following the initial setting of the investment which requires fifteen or twenty minutes, it is cut off flush with the top of the crucible-former; the bell is grasped in the left hand with the thumb resting upon the top of the investment to prevent this portion from being detached when the crucible-former is removed; this is done by tapping gently with a spatula or some other light instrument. (*Fig. 5*). With a large vulcanite scraper the inside of the crucible mound is cut out to a size that easily will receive thirty-five or forty pennyweights of molten gold.

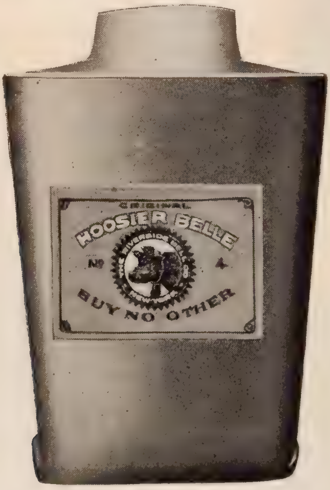

Fig. No. 5—Cow-Bell Flask showing investment compound crucible.

BOILING OUT OR BURNING OUT THE MOLD

If the operator desires to boil out the wax from the mold it is now allowed to dry until it is hard set. It may then be placed in boiling water or in cold water which is allowed to heat to boiling temperature and continued at this heat for ten or fifteen minutes, depending upon the size of the pattern. When the laboratory is comparatively large the odor will not be objectionable, and the time may be shortened more than an hour by burning out the wax instead of boiling. In the burning-out process, the case, immediately, after the crucible is cut, is placed in the Hoskins (Type FA) Electric Furnace (*Fig. 6*), or in any other furnace of similar size and character; the switch is turned and the door left open so that the melted wax may fall upon a paper spread in front of

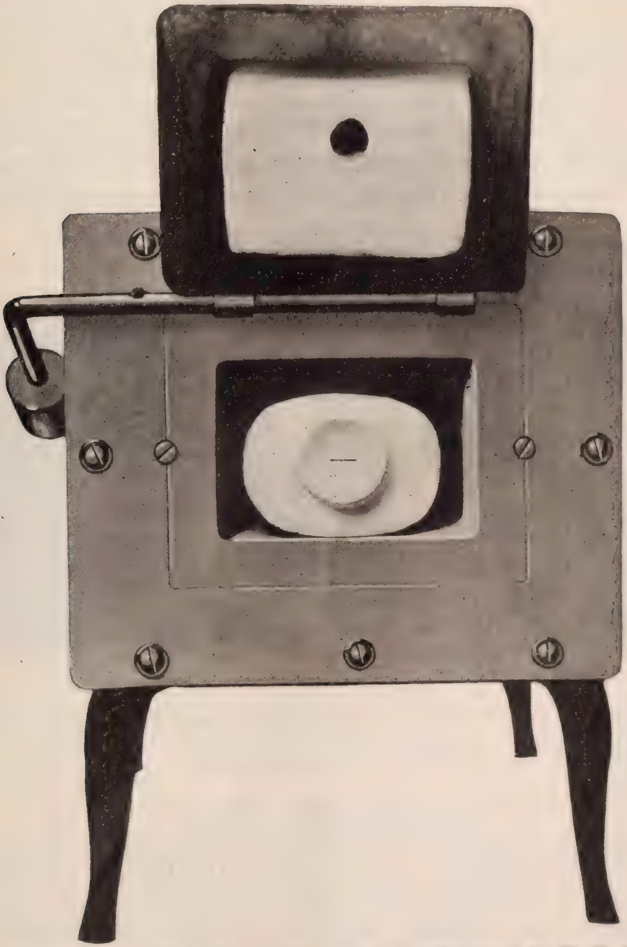

Fig. 6—Hoskins (Type FA) Electric Furnace manufactured by E. H. Sargent & Co., 165 E. Superior St., Chicago, Ill. Note the small sprue opening of invested case placed in furnace for purpose of burning out the wax.

it; when the wax ceases to run, the case is placed in the center of the furnace and the door closed. The door may be opened at intervals to note the progress of the case. At the end of forty-five minutes the operator will detect through the slit in the investment which provides the sprue opening, a reddish glow within the interior of the mold and at the first appearance of this glow the case is removed and supported in upright position on the bench ready for casting.

CASTING

While the case is burning out, the operator will roll out some moldine into a roll a little larger than a lead pencil and will place it on the inside of the female portion of the casting device which fits over the crucible (*Fig. 4c*), thus providing an air-tight connection. The 20-karat gold which previously has been melted into a nugget and cleaned, is now placed in the crucible and melted with the acetylene and air blow-pipe.

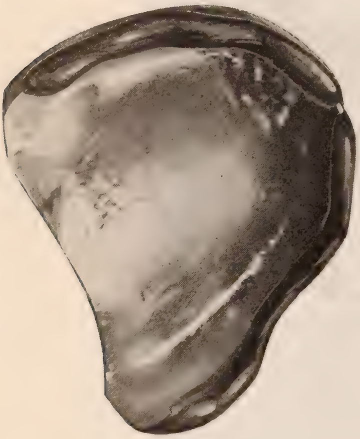

Fig. 7

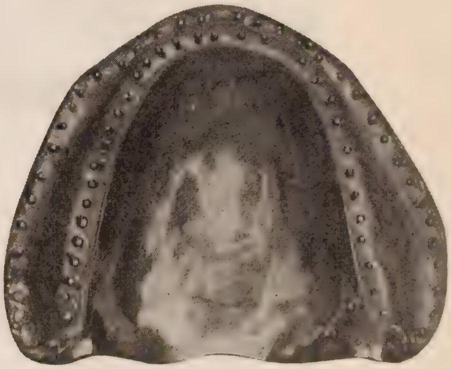

Fig. 8

Fig. 7—Gold base with border of S. S. White Black Impression Tray Compound ready for wax rim and try-in

Fig. 8—Finished base showing ball-like attachments.

Where a refiner is easily accessible best results will prompt the operator to use new gold each time. However, where this is not convenient, gold that has been used may be melted into a nugget and while under the flame may be sprinkled with a mixture composed of equal parts of powdered borax and saltpeter; with the use of a slate pencil the molten metal may be stirred until it is thoroughly cleaned.

When the gold approaches a bluish white color an assistant removes the blow-pipe while the operator with his left hand sets the casting device down over the crucible, and with his right hand firmly presses it in place and at the same time expresses the air from the bulb, using a continuous pressure of the fingers for a period of sixty to one hundred seconds. Amber smoked glasses or goggles should be worn in order to protect the eyes from the intense glare of the blow-pipe flame. While much has been said and written by advocates of various combinations of air, acetylene, oxygen, hydrogen, natural and artificial gases projected through blow-pipes of various designs, the writer, although having tried every combination that seemed to offer any superiority, finds that the simple blow-pipe (No. 27) introduced several years ago by the Buffalo Dental Mfg. Co. for use with artificial gas, is entirely satisfactory when used with "Prestolite." The resulting castings yield practical results fully the equal of those cast with the use of other combinations producing a "natural" flame.

COW-BELL METHOD EMPLOYED FOR GOLD BASES AS WELL AS FOR ALUMINUM

While the casting device which is described above will be employed more successfully by those who are just beginning to cast gold bases, the skilled operator may dispense with it and employ the simple cow-bell method and the swinging or centrifugal principle of throwing the molten gold into the mold. Simplicity, strength, and speed have characterized the writer's methods from the beginning of his professional career—simplicity of method and equipment; strength for utility and endurance; speed, through the elimination of unnecessary steps and delays in the achievement of results. Simple methods encourage concentration of effort while simple equipment usually assures increased dependability; strength and utility never may be sacrificed to beauty or to any other feature without extending an invitation to grief and disaster, while needless delays incidental to circuitous procedure greatly reduce the productive ability of the prosthetist. Accordingly, the writer continues to use the cow-bell method of casting metal bases; superfluous auxiliary sprues are dispensed with in waxing up the pattern for investing, more than an hour's time is saved through burning out the mold, and anxiety with reference to casting successfully is eliminated along with "gits,'' "gates," "vents" and similar air-escapes, through simply availing himself of an investment material sufficiently porous to provide its own escapes.

SWEDGING AND FINISHING

The casting is allowed to cool fifteen or twenty minutes or even longer, when it may be put into water and then removed from the flask by tapping the mouth of the inverted bell with a horn mallet. After cleaning and brushing in running water, the casting is immersed in hydrofluoric acid to remove all traces of fused silex, it is next washed in a bath of bicarbonate of soda, after which it is washed in running water and then pickled in hydrochloric or sulphuric acid; any microscopic nodules are removed with the use of a small, dull, vulcanite scraper; the sprue is cut away with a pair of crown scissors and any excess removed with a carborundum stone upon the lathe.

The base is now placed upon the soldering block and after heating up the entire case, the wires which are to serve as vulcanite retainers are melted down upon themselves, one at a time, by directing the flame of the blow-pipe against the end of a wire until a ball-like end is produced. (See *Fig. 8*). When these are finished ideally the balls are in such close proximity to the base that they resemble gold shot lying upon it. Such retainers strengthen the base whereas any method of using holes to aid retention has a tendency to weaken the base without really providing any comparable form of attachment for the vulcanite.

After placing the base upon the original Spence cast it is adapted in a preliminary way, especially around the tuberosities and at the posterior border by means of hardwood sticks and horn mallet. It is then placed in the putty swedger and given one blow with a sixteen-pound sledge hammer. After removing from the swedger and from the cast, the base is polished with the usual polishing equipment and then a high polish added with the use of floated silex mixed with water and applied by means of a rag wheel. The lower base always is swedged *after* it is finished and polished in order that swedging may correct any slight distortion that may have occurred.

VULCANITE BORDER FOR GOLD BASE

If the base is to be provided with a vulcanite border the following method is employed: After the case is taken from the swedger the base is removed from the Spence cast to insure easy removal at a later stage; the cast is very lightly oiled with vaseline in the region to be covered by the vulcanite border, the base is then returned to the cast and the proposed vulcanite border is supplied with S. S. White Black Impression Tray Compound following the desired contour and allowing it to lap over upon the retainers so as to hold it firmly while being tried in the mouth. (See *Fig. 7*). The regulation occlusal model may be built upon this. By using the black tray compound as suggested, the case may be invested after the teeth have been provided and thus obviate the necessity of vulcanizing upon the Spence cast which is thick and unwieldy.

While the writer is not unmindful of his indebtedness to numerous sources for helpful suggestions which have enabled him finally to cast gold bases that are as satisfactory for the prosthetist as inlays are for the inlay specialist, many of these suggestions have been unconsciously assimilated and consequently specific credit cannot now be given. However, he desires to make acknowledgment of two features for which he is deeply grateful; these features are strikingly simple and at the same time very obviously in accord with the laws of physics, namely, casting with the use of a single flat sprue and with the mold in vertical position. They were first presented in a paper read by Dr. W. Clyde McClelland, of Kansas City, Mo., before the Georgia State Dental Society at their Semi-Centennial meeting, in June, 1918.

FOCAL INFECTION AND HOW TO AVOID IT WITH RESTORATIONS ON VITAL ABUTMENTS*

BY E. R. HART, D.D.S., ST. LOUIS, MO.

THIS OPPORTUNITY is to me a genuine pleasure and, be assured, I appreciate it to the fullest. Some twenty years ago I graduated from the Dental Department of your State University. Little did I then think that the great honor would be bestowed upon me of being invited to address men, some of whom were then my teachers, and many my classmates and under-class fellows.

If you will permit me, I should like to pay a tribute in my small but sincere way, to two of the gentlemen who were an incentive to me then, and who, to me, are still examples worthy of emulation. It is to these two men who inspired me with ideals and ethical standards of professionalism, and who also gave me breadth and vision, that I pay this tribute. Gentlemen, these men are in our midst; one has grown older in years but young in the love and reverence of his colleagues and the great dental profession. I refer to that honored and gentlemanly man, Dr. L. G. Noel. The other gentleman although he is but little my senior, (and I would have you know that my gray hair is but an accident and not a sign of age), is our well known and up-to-the-minute friend Dr. R. Boyd Bogle.

Out of respect to those who have passed over the great divide, I think it but fitting and proper that we pause and remember with reverence the names of such men as Doctors J. Y. Crawford, W. H. and H. W. Morgan, Wm. T. Arrington, D. R. Stubblefield and others who have helped to make American dentistry famous throughout the world.

In approaching the subject of this paper I feel a reluctance, inasmuch as the field of focal infection with which we are concerned and for which we are responsible, is so very little understood, and much less appreciated.

Many physicians, and even many dentists still disregard the teeth as a possible source of dangerous somatic infections. The average dentist has very little knowledge of pathology and bacteriology, and the little which he does possess was imparted to him before these fundamental sciences were recognized as basic prerequisites to a general knowledge of morbid processes. Due to this lack of knowledge many and varied treatments have been evolved. Is it any wonder then, that physicians and dentists will be satisfied, in spite of the fact that after skillful treatment by the average practitioner, there may remain in and about a tooth sufficient infection to produce or result in a focal area, which sooner or later will be of serious consequence to the entire body?

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*Presented at the meeting of the Tennessee State Dental Society, May, 1920.

Quoting from Novitzky: "In the examination of hundreds of devitalized teeth from a pathological standpoint, many of us are convinced that all pulpless teeth are more or less septic and are subject to the laws of putrefaction and fermentation, and all are infected within a few months. This finding which has been given wide publicity has not been accepted by many leaders of our profession; they have either opposed or derided it. They claim that a pulpless tooth may be retained and filled aseptically with practically no danger of post-operative periapical infection. They have held that their view could be established as a fact by roentgen-ray examination and cultural tests. But their argument has remained one of theory, although the question is one of fact, which can be proved or disproved by examination, test and experiment."

Many there are that maintain that a tooth may remain uninfected after pulp extirpation. As yet, I have to find one who can say that one properly-conducted cultural test, six months after pulp extirpation, did actually establish a lack of infection as a fact. The presence or absence of a septic area is hardly a thing to be determined as a matter of opinion. This presence or absence of a septic area cannot be decided as some men would have it decided, by formal scholastic debate. Most physicians and dentists are willing to admit that an absolutely dead tooth cannot be retained permanently sterile in the jaw. Many hold that a tooth is not dead when it is devitalized—they do not use the word "devitalized" as given in Webster, "To deprive of life or life-sustaining qualities," but in the sense of "to remove the pulp." They claim that this operation of pulp-removal or devitalization does not cause the tooth to become dead. They insist that a pulpless tooth may retain vitality, receive nourishment and be capable of regeneration. Upon the truth or untruth of this claim depends the answer to the question of whether a devitalized tooth can be retained in a permanently sterile condition in the jaw. And the truth or untruth of the claim must be determined, not by conflicting statements of dental histologists cited as authorities, not by theories, not by opinions, but by scientific facts, established by first-hand observation and experiment.

That a pulpless tooth does receive nourishment is supported by no sound evidence. The only argument in favor of this view is purely an argument from authorities. Dr. Grieves, in the *Journal of the National Dental Association*, August, 1918, page 783, says: "While there has been no proven communication through the first cemental lamina which is quite dense, the nearest vital cells, the cementoblasts in the second lamina, suggest from the trend of canaliculi which is only in the direction of the pulp and peridental membrane, that some osmosis of tissue juices must exist from pulp to membrane; in fact, any other condition is biologically inconceivable."

A personal correction: These canaliculi, when they are found, extend generally toward the pericemental membranes and only exceptionally toward the pulp; in fact, we never have observed a canaliculus extending to the pulp.

Dr. Grieves supports his view by quoting from Hopewell-Smith a statement from Tomes, saying that the leading histologists agree with Tomes. Again Dr. Grieves says: "Sufficient evidence has now been presented to establish as the very first consideration, the vitality of the apical cementum which must not be destroyed in pulp devitalization." How absurd, when in truth, Hopewell-Smith, Noyes and Black entirely disagree with the view of Tomes.

These men, Hopewell-Smith, Noyes and Black, give us evidence sufficient to prove that the human tooth is not kept vital by cementum. They have stated repeatedly that normal cementum is structureless and that blood vessels do not and cannot pass through it from joint to pulp, or vice versa. Blood can pass from joint to pulp only by way of the apical foramen or foramina; therefore, all devitalized teeth are dead teeth, and no one can point to a single tooth which does not show traces of infection six months after devitalization.

We believe that every dentist feels a reluctance in approaching root-canal work, because there always remains a doubt that the infection has been eradicated, and there is a possibility that in filling the canal we are sealing in the dentinal tubuli infected organic matter. The dentinal tubuli as well as the granular layer of Tomes, due to the action of bacteria, have undoubtedly undergone a change. This change or degeneration usually extends toward the dento-cemental junction, thereby producing dentin which is not only dead, but infected. At the same time that we have this degeneration and infiltration of the dentinal tubuli and granular layer of Tomes, there may exist a necrosis of the cementum covering the root apex, which may be far more septic. This in turn destroys the investing tissues; the attachment of the apical fibers of the pericementum are first to go, followed by the fibers of the oblique group.

In the same proportion to which this detachment deprives the cementum of its blood supply or nutrition, the hard tissues undergo a change, and we may expect to find a rarefying osteitis of the cancellous bone surrounding this portion of the necrotic root, substituting for the normal bone an infected granulation tissue.

Quoting from Dr. Arthur B. Crane: "The surface of this proliferating tissue which approximates the necrotic tissue has a tendency to undergo an indolent liquefaction, and in advanced granulomata, this metamorphosis also takes place where the soft tissue comes in contact with the bone. In either instance the hard tissue deteriorates. The cementum becomes roughened and the bone becomes softened. Therefore, in a case of periapical infection, infection exists in the canal and canal walls, the dentinal tubuli, the apical cementum, the granulation tissue investing the apex, the bone adjacent to the granuloma. Each of these areas is dependent upon, or contributory to the others; therefore, sterilization is not possible until all infection in each of these sites has been eliminated. We can appreciate the difficulty of thoroughly sterilizing these interdependent seats of infection because of the fact that we have both living and dead tissues involved."

"According to the findings of Carrel and many others in the field of research, we are decidedly convinced in the conclusion that infection in living tissues never can be overcome by saturating them with drugs strong enough to destroy the tissue cells. In dead tissue of course, we are dependent upon the germicidal effect of poisons brought into actual contact with the invading organisms; therefore, it is irrational and absolutely impracticable to attempt to sterilize both living and dead tissue with the same agency."

From all of the data compiled up to date on focal infection, just what are we to believe? Is there any treatment that we can use and feel confident that it will take care of the canal, canal walls and tubuli, the denuded cementum and the periapical tissue? We know there is no one agency that will surely and completely sterilize all of the aforementioned sites.

Most operators lose sight of the pathogenicity of the apical area and the dangerous results to the host. They have in mind only the extermination of the streptococci by means of drugs or combinations of drugs, never taking into consideration other tissues around the roots being treated.

A radiographic survey of the apical field after treatment and final root-canal filling which shows negative, should not be accepted as sufficient evidence of a successful operation, for there may remain ever so few pathogenic micro-organisms in and around this area, which, under proper conditions, may set up a morbid process. This morbid process may rise to such dignity as to be a contributing factor in the ultimate death of the host.

It has been found that focal infection remains, although bone may regenerate completely in a rarefied area at the apex of a chronically-abscessed tooth after its apparently successful treatment and final root-canal filling. On aspirating the sockets of chronically-abscessed teeth which for years had remained quiet, pure cultures of streptococcus viridans were obtained, although according to radiographic findings these areas had been diagnosed as non-pathogenic. This would seem to prove the inefficacy of our periapical therapy.

Inasmuch as foci of infection of the periapical region cannot be successfully treated by ionotherapy or therapeutics, we must rely upon the surgical removal of these teeth for the complete eradication of these morbid processes.

Dr. Ulrich, of Minneapolis, in an effort to correlate oral sepsis with systemic lesions, particularly in patients exhibiting rheumatoid conditions, made special inspection of mouths for pyorrhea, gingivitis, caries, and by means of the X-ray, for apical abscesses. A little over sixty-eight per cent. of all artificially-devitalized teeth were found with apical abscesses, and in five hundred cases, the total number of abscesses on 1350 dead teeth, including those found on pulpless teeth, due to caries or accident, or to proximal fillings, was eighty-three per cent.

Seventy-six cases in which a streptococcus was isolated from apical pockets were analyzed clinically, and the striking feature of this analysis was the diversity of clinical manifestations for which streptococcal focal disease is responsible. Of the more striking foci or symptoms in these groups, we have manifestations of rheumatoid conditions, 51%; heart lesions, 47%; blood (that is, secondary anemia), 43%; tonsils, 40%; pyorrhea, 25%; kidneys, 34%; caries, 15.8%.

Henrici, from the department of medicine of the University of Minnesota, reported 107 cases from the university clinic, of which 100 gave streptococcus viridans; 52 were from a private clinic, 50 of which gave streptococcus viridans or streptococcus hemolyticus, and occasionally streptococcus mucosa was recovered. Thus, 150 of these 500 cases gave evidence of streptococci either in pure culture or as dominant organisms.

Hartzell and Henrici found that in 162 cases, 150 yielded streptococci. They reported inoculation of twenty-four rabbits with streptococcus viridans isolated from apical abscesses; heart lesions were found in five, kidney lesions in seven, those of the aorta in three, and of the joints in two.

Is it not possible that these foci are secondary deposits and not primarily dental? They are conveyed to this area of lowered resistance by blood stream and lymphatics, there to take up their habitation and propagate, all unknown to the unsuspecting host. The radiograph is without value in determining this condition. By the retention of pulpless teeth you are making for the growth and propagation of the micro-organisms, because it is in this area of lessened viability about the teeth, due, in turn, to the lack of blood supply and also the change in oxygen tension, that these few micro-organisms in the body will increase in number and virulence while inhabiting these areas which lend themselves so beautifully to incubation. Exudation, proliferation and degeneration are sure to follow. Lack of blood supply anywhere spells ultimate death to the part.

Again quoting from Dr. Ulrich: "Most men if they admit that there is anything at all in oral focal infection will say that it is due to pure root-canal work, but this seems very improbable for out of 159 possible infections, 150 will prove streptococcal in origin. If there were not some broad biological law, such as the selective and mutative activity of this group, how otherwise could we account for such findings? Experimental evidence as to the mode of origin of the abscesses has not been secured. Their pathogenicity and their relation to other concurrent foci have had ample clinical verification. There are four striking forms of evidence for this judgment:

"*First*, acute exacerbation of systemic symptoms takes place following their removal; in other words, focal reactions occur owing to auto-inoculation at the time of their reduction.

"*Second*, acute new systemic symptoms have followed reduction of these areas; in other words, other foci were established.

"*Third*, improvement and sometimes total recession of other focal areas followed the extirpation of these sites.

"*Fourth*, local and focal reactions occurred with vaccines prepared from infected apical areas."

In the light of the doctrine of focal infection can we ignore the significance of the blind apical abscess? Can we gloss over the fact that out of 100 possible infections, 95 prove streptococcal in origin?

Every pulpless tooth presents an area of lessened viability, which, by hematogenous channels, results in the beginning of a proliferative periodontitis, then fibrous granulation formation and root exostosis, which condition should be looked upon as of benign tumor formation. This growth of lawless, osseous tissue, without any distinct physiological function to fulfill, is brought about by hyperplasia of the cells due to chronic irritation. Not alone may we have a condition of root exostosis *per se*, but complicating this condition we may have one of pressure atrophy and pressure toxemia, which invariably results in necrosis. Proliferation of cells within a circumscribed area will simulate a condition of pressure toxemia, which condition is characterized by the degeneration of cells, due to the pressure of the tumor upon cellular tissue, and the presence of decomposing bacterial products as well as cellular infiltration and cellular metamorphosis.

Lastly, do not lose sight of that destructive process of osteomyelitis, which may have its etiological antecedent in the case of a pulpless tooth, with apical area of lessened resistance. All cases of osteomyelitis are characterized pathologically by thrombosis, coagulation, necrosis of the cells and necrosis of the osseous tissue. We know experimentally that from a localized staphylococcus infection we can have a septicemia, resulting in a malignant endocarditis, and which secondarily may invade the vicera and simulate a general pyemia. If perchance the streptococcus should be the predominating organism we would be most apt to have a lymphangitis, marked edema and cellulitis.

There is only one way open to the public to avoid this unusual increase of morbid conditions, and that is to refuse absolutely to allow dentists to devitalize their teeth, which, as you know, entails the destruction of the nerve and blood supply to the apices of the teeth with the trauma and lowered resistance that follows. Devitalized teeth are of grave significance to the health of the community, and in those individuals already invaded by streptococci it is decidedly reprehensible. After all, what object is to be gained by the retention of these pulpless teeth? What possible sense is there in trifling with things that so vitally affect one's health and welfare? Why not eliminate them and be safe? We don't want to be experimented upon, and we are not going to ask our patients to take any medicine that we are not willing to swallow ourselves. We wonder how long men are going on placing teeth in a situation where, in order to render them tolerable, they have to treat them with electricity or soak them in the salts of silver. We are sure it is a practice that is not justified in the mind of anyone familiar with the diseases caused by dead teeth, nor in the mind of anyone familiar with the pathology of the teeth themselves.

Dr. Raper has said, with the knowledge of a master mind, that "What we want is less root-canal work, and better—mostly less."

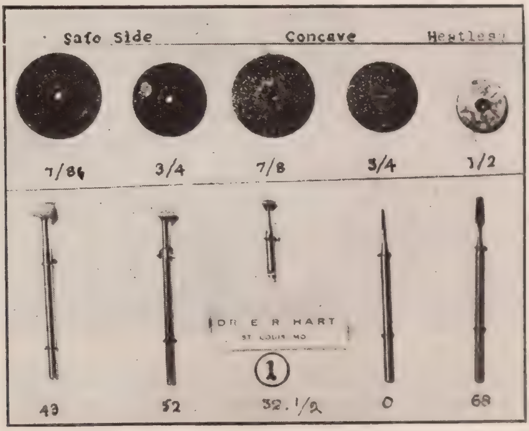


Fig. 1—Discs, stones and burs used in preparation for this work.

And gentlemen, let me tell you that it is impossible to camouflage the public today with talk of asepsis, ionization, etc., and get away with it for long. Neither can one fill a root canal and at the same time fill the patient's ear with an alibi.

You may feel that by advocating the removal of so-called dead teeth I have taken from the dentist his very means of making his daily bread. This is not true, for most all the worries, disappointments, waste of time, and the greatest dissatisfaction to both the patient and the dentist, are through the treatment of teeth. It is estimated that in offices where teeth are treated almost fifty per cent. of the operating time is given up to treatments. All of our comebacks, malpractice suits and mishaps are due almost altogether to teeth we have treated. So then, we are interested in how to replace these teeth which will be lost. *First*, by fixed bridges; *second*, by removable work; and last, by full dentures.

Your worthy president, while visiting with me, had an opportunity of seeing a technic which we use in our office, and best of all, to see this technic carried out in actual cases which I will show you on the screen. He it is whom you may blame mostly for my being here. I will very briefly outline a technic used in our office. This technic holds good for all teeth, centrals, laterals, cuspids, bicuspids and molars, *varying* only as the shapes and outlines vary, but the principles are so distinct that any departure from fundamentals spells ruin.

Black's technic for cavity preparation is followed as to paralleling, extension for prevention, beveling cavo surfaces, but the toilet of our preparation is quite different but very necessary, and differs owing to the nature of the work. In the preparation of all teeth for the bevel crown the same underlying technic is used. The principle of the central holds good in the molar, only varying with amount of tooth structure to be removed to carry all margins into areas of immunity.

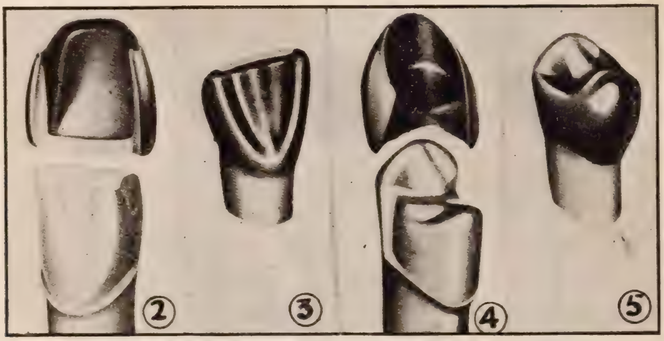


Fig. 2—An upper central incisor prepared where the incisal edge is not involved. We have left strong unabraded enamel with healthy dentin supporting it.

Fig. 3—Three-quarter preparation in place showing enamel across the incisal.

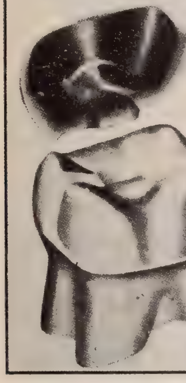
Fig. 4—Upper bicuspid, showing the bevel. We have removed only sufficient enamel over the cusps and out to the sulci to give us sufficient depth of wax to cast.

Fig. 5—Bicuspid with casting in place.

The same stones and discs which are employed in preparing the centrals are used in preparing the molars, and I would suggest that you take the numbers of these stones at our clinic. All cutting is done under a stream of very warm water and preferably without an anesthetic, for fear of deep cutting. You will be surprised at the absence of pain.

All mesial and distal walls are removed with vulco-carbon discs, the mesial with a straight safe-sided disc, always beginning the cutting back of the point of contact and holding the disc slightly diagonal, coming out at a point just under the free margin of the gingiva with a bevel not wider than the thickness of the disc; on the distal with a concave disc, bringing extension of these margins to the buccal or labial as the case may be, into a zone of safety. Next, the buccal or lingual surface as the case may require, is reduced to a very gentle incline with a bevel just above or below the gum margin as the conditions demand, connecting the mesio-distal bevels with the buccal or lingual with a suitable small and tapering fissure-shaped stone in right or contra-angled hand-piece.

Occlusal surfaces are next ground, but never flat, except in teeth where from natural attrition, the cusps are entirely worn away, for in all cases, after grinding the occlusal its general shape should conform to the tooth before preparation was started; grinding as a rule, not more than from a millimeter to a millimeter and one-half, but this thickness should obtain in fissures, transverse grooves and pits as well as on the tips of the cusps. You will gain sometimes as much as half of the length of all frictional walls from gingival to incisal edge and add protection to the pulp's horns. We now cut mesial-distal parallel grooves with a depression over the incisal or occlusal to give thickness of gold for reinforcement against the overload, and to overcome lingual displacement under stress. We now have prepared the mesial and distal surfaces, buccal or lingual and connected them, also the occlusal with our parallel mesial-distal grooves are finished, and we now refine our bevel with chisels just as any cavo-surface bevel should be refined to take care of short enamel rods.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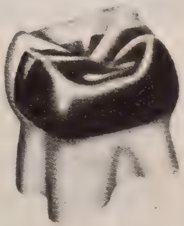
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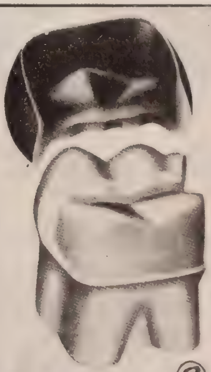
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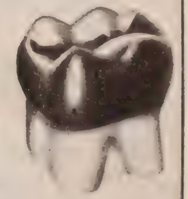
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Fig. 6—This is called a mesial one-half crown, used where you have isolated molars, or in the mouths of those who have a dentist who really does prophylaxis as it should be done. Those cases involve only half of the tooth, cutting down the time of preparation over one-half.

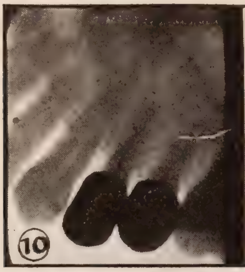
Fig. 7—The casting in place.

Fig. 8—Three-quarter preparation of a lower molar.

Fig. 9—The casting in place.

Our next step in the molar and bicuspid region is to paint all enamel walls with cocoa oil, dry tooth, and paint all cut surfaces with silver deposit, again dry, and paint with very thin varnish, as used over synthetic cements—in the centrals, laterals and cuspids we use phenol and evaporate it with hot air, then varnish. This is done for prophylactic reasons, for in my opinion, the pressure used in forcing wax against the cut surfaces especially where the dentin has been exposed, drives infectious material into the dentinal tubuli.

After casting and finishing, the abutment pieces are driven to place, and we now select the color of our facings and take a core impression of full upper and lower in Kerr's modelling compound, never in plaster of Paris. These bridges will not, as a rule, go to place when the impression is taken in plaster.



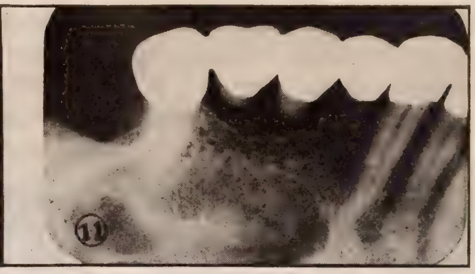
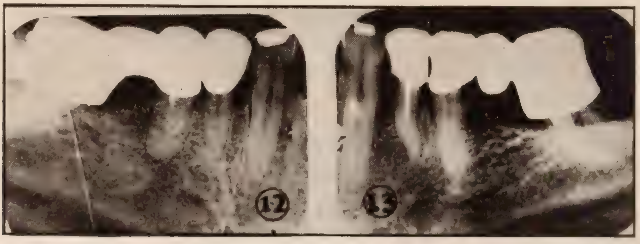


Fig. 10—Case before teeth were extracted.

Fig. 11—Replacement. A long difficult bridge, because it is very difficult in a case like this to obtain balanced occlusion.

Run up the bridge model in S. S. White's sump, and the occluding model in Austin's synthetic stone, articulate them on an anatomical articulator; with radiograph before you to determine the length and inclination of the root or roots, cut off teeth which are to be replaced and drill out sockets. Now select the mold of the facings, bake roots of high-fusing porcelain, then wax up and cast backings, finish and polish each tooth, assemble and solder on model at points of contact. If you have no root sockets, bake a tapering porcelain base to fit the apex of the ridge, and proceed as in case of previously-outlined bridge. Pickle in hydrochloric acid.

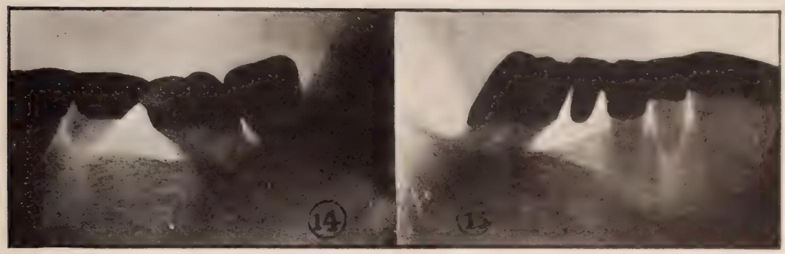


Figs. 12 and 13—I believe these need no explanation.

We are now ready for the extractions, immediately after which operation the bridge with porcelains uncemented is tried in. No corrections being necessary the bridge is removed, washed, dried and porcelains cemented. After the cement has thoroughly hardened, the bridge is immersed in eighty-five per cent. alcohol, which, for aseptic purposes is not dried off the porcelain roots. The abutments and abutment pieces are dried, a thin film of cement is placed in abutment pieces, and the bridge is cemented. I will not burden you further with technic but will sum up the advantages of the technic for this work.

First, abutments vital.

Second, least amount of cutting, thereby saving tooth structure.



Figs. 14 and 15—The replacements for Figs. 12 and 13.

Third, absolute joint at periphery, thereby avoiding irritation to gum tissue, consequently not producing gingivitis with its fatal results.

Fourth, greatest amount of strength.

Fifth, sanitation. All surfaces of dummies that are in contact with the soft tissue are of porcelain, thereby gaining cleanliness.

Sixth, all lingual surfaces of dummies contured, making for sanitation, and not interfering with articulation and enunciation.

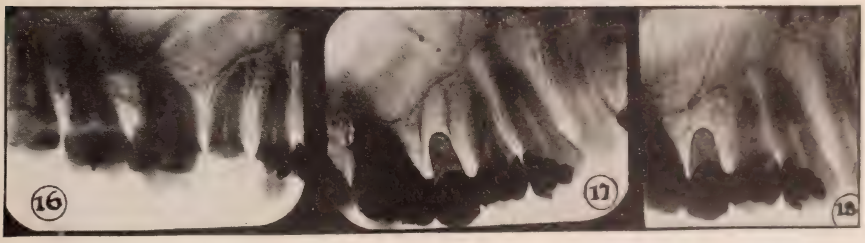


Fig. 16—A bicuspid with mesial inclination. This shows the necessity for the radiograph.
Fig. 17—Replacement after three months.
Fig. 18—The case after three years.

Seventh, esthetic. Dummies have proper labio-lingual or bucco-lingual diameter, overcoming the flat slab-like appearance. They butt in the center of ridge or from the original root sockets making better gingival and incisal alignment.

Eighth, anatomically correct, as teeth are carved separately for each case and not stamped from a die-plate.

Last, but not least, there is a psychology about this work, as there is about any work well done. The operator has that satisfaction which comes from rendering the highest type of services for which he can unhesitatingly command a fee, and for which the patient willingly pays. I know some may say, "It can't be done." To him I will say, "Withhold your judgment until you have tried."

In conclusion let me give you an inspirational message:

IT CAN BE DONE

Somebody said that it couldn't be done,
    But he, with a chuckle replied,
That maybe it couldn't, but he'd not be one
    To say so till he tried.
So he buckled right in, with a bit of a grin
    On his face—if he worried he hid it.
He started to sing, as he tackled the thing
    That couldn't be done, and he did it.

Somebody scoffed, "Oh, you'll never do that—
    At least, no one ever has done it."
But he took off his coat. and he took off his hat,
    And the first thing we knew he'd begun it.
With a bit of a grin and a lift of his chin,
    Without any doubting or quibbing,
He started to sing as he tackled the thing
    That couldn't be done, and he did it.

There are thousands to tell you it cannot be done,
    There are thousands to prophesy failure;
There are thousands to point out, one by one,
    The dangers that wait to assail you.
But just buckle in, with a bit of a grin—
    Take off your coat, and go to it.
Just start in to sing as you tackle the thing
    That cannot be done, and you'll do it.

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PORCELAIN JACKET CROWN PREPARATION

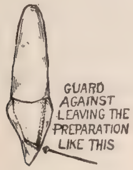
BY L. F. MEGAW, CHICAGO, ILLINOIS

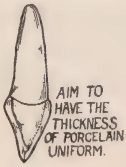
(DENTAL CERAMIST)

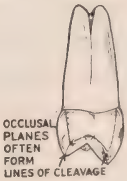
IN PRESENTING this article on porcelain jacket crown preparation, the writer's aim is to emphasize the importance of following the steps consecutively. A great deal of study has been given to the subject in an endeavor to combine the best results with the greatest saving of operating time. Elaborate, complex technic is unnecessary and often leads to confusion, but careful attention to detail in every step is of the greatest importance.

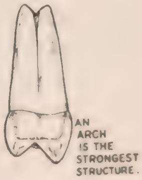
The typical case here outlined is that of an upper central because of the convenience in drawing, but the principles may be applied to all cases.

A "shoulder" must be cut to uniform depth completely around the tooth, well in under the free gum margin. It should be about the width of the enamel plate at the normal gum line, varying in different teeth from one-half to one and one-half millimeters. The remaining "core" must be planed down to the depth of the shoulder, shaped to follow the general outline of the original tooth, reduced in size and with all undercuts and sharp angles removed.







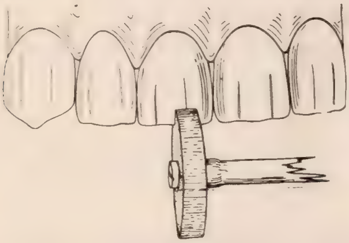


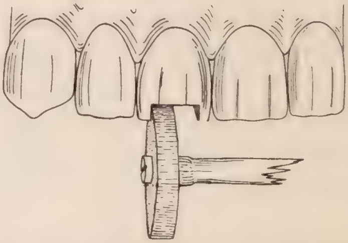
Shape the prepared tooth so as to present the greatest support to the restoration, taking care not to cause weakness in the porcelain. In cutting down the labial surface note that the normal curve of this surface is followed. A bur held parallel to the axis of the tooth will produce a preparation that will cause a normally carved jacket crown to have a thin spot on the labial surface. In placing so-called occlusal planes on the surface of molar and bicuspid preparations to meet and divert the stress of mastication, be careful that wedges and lines of cleavage are not also formed.

The principles involved are the same whether the dentin remains intact or whether a casting is used to build up lost tooth structure. Any normally-formed tooth that requires a jacket may be practicably prepared without involving the pulp.

STEPS OF PREPARATION

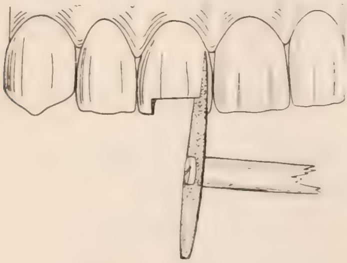
A carborundum stone of convenient size is used to remove the enamel across the incisal edge, cutting down that part of the tooth about one-third of the length of the tooth. It may be noted that it is not necessary to cut off the entire incisal edge but, by starting above the position of the mesial dentino-enamel junction the stone may be carried across only far enough to reach that relative position at the distal. This reduces unnecessary grinding and leaves on the tooth a guide for the next instrument.

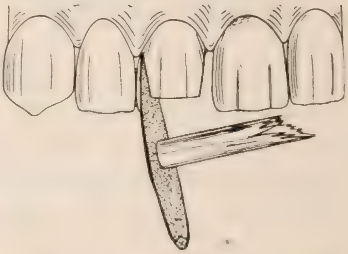




Starting a separating disk at the step left by the stone, directing the edge steadily toward a point within the gingival margin, a section of each proximal side is then removed, leaving the tooth with enamel remaining on the labial and lingual surfaces only and with a slight outline of a shoulder at the proximal gingival margins.

Take care not to cut the gums. Remember that the proximal shoulders need not be carried down as far as the labial and lingual sections. On the posteriors, especially, the disk practically forms the shoulder. If the disk cuts too far, the shoulder will be cut off at the point where the bifurcation constricts the tooth and it will be difficult to reestablish the shoulder without excessive sacrifice of tooth structure.

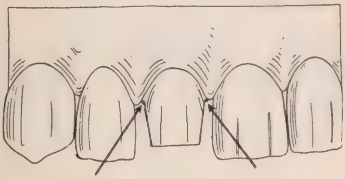


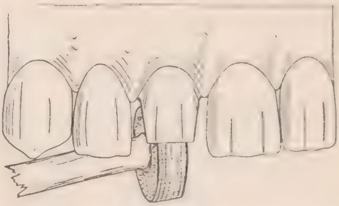


Conveniently-shaped stones may now be employed to remove the enamel remaining on the labial and lingual surfaces. A one-half-inch stone will meet all requirements on the plane surfaces and a cup-shaped disk or a tapered carborundum point will be found useful in reaching the corners.

With practically all enamel removed, the tooth will present a general tapering from the gingival margin toward the incisal, and this is the most convenient time to adjust the impression tube. The tube is to be used after the preparation is completed but, as fitting over a shoulder that has been cut under the gum is a difficult procedure, time will be gained in fitting it now over the tapered tooth.

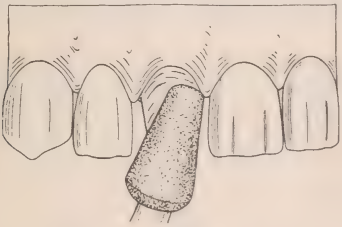
Make the tube as you would the band of a gold crown, not fitting too snugly. Have it fully twice the length of the teeth and pinch the upper end closed, making a convenient finger-hold and sealing against back pressure. Copper, about thirty or thirty-two gauge may be used, soldering with silver solder but many prefer to use crown gold plate. It is convenient, more readily soldered and fitted and the metal may be melted up for casting work after the case is finished.

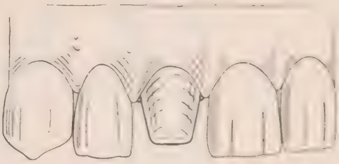




Cut the metal to a wire measurement of the tooth. Fit fairly close and trim it to pass over the root and under the free gum margin. Mark the *labial* surface "x" and lay it aside ready for use when it is time to take the impression.

A No. 58 square-end fissure bur, either straight blade or spiral (not cross-cut) may be used to lay a groove into the surface of the tooth, guiding it toward the gingival margin so that the square end blades define a ledge just at the gum line.



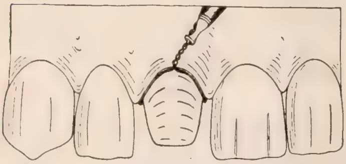


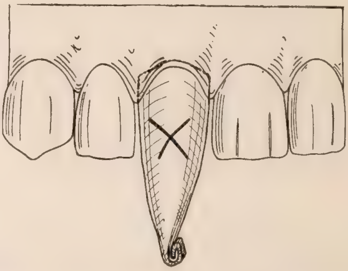
Start another groove at the side of this one, repeating until the surface of the tooth is covered with a series of parallel grooves cut to uniform depth. Then, with a side motion of the bur, connect the grooves.

Cutting to a depth of one-half the diameter of the bur suggested is about the right amount in most cases, and it is salient that throughout this technic the bur is under absolute control never cutting more deeply than necessary. If all enamel was removed the bur will cut quickly and smoothly. If invisible flakes of enamel are encountered they may be removed with a stone. Cross-cut burs cause more pain and offer no compensating advantage where no enamel remains.

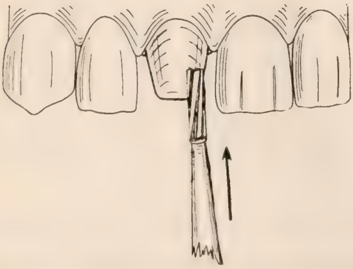
It is to be noted that throughout this procedure care has been exercised to avoid making the gum bleed. A hemorrhage obscures the field of operation, clogs the blades of the bur and renders precision difficult. Care also should be taken to keep all stones wet and to avoid heating the burs, especially if an anesthetic is used. Dead pulps have been the result of a little carelessness in this regard.

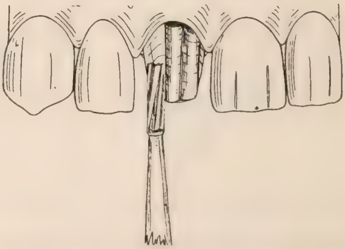
Now pack back the gum and dismiss the patient for twenty-four hours. Temporary stopping or gutta percha may be molded over the tooth, pressed well between and under the bulge of the adjacent teeth, applying pressure that blanches the gum around the object tooth. When the patient returns the next day and the packing is removed, the shoulder which was outlined *at* the gum line on the previous day will be exposed between one and two millimeters *above* the gum.





The No. 58 bur may again be used to carry the shoulder down to the present gum line, thus placing this shoulder well beneath the normal gum margin, even almost to the attachment, while at all times working above gum tissue with a clear field of operation, unobscured by hemorrhage. Some prefer a "finishing" bur or an Arkansas stone to run over the shoulder, removing bur marks and irregularities. See that the shoulder is uniformly deep and continuous, following the gum line completely around the tooth. Sand-paper disks may be employed to "finish" the preparation, polishing down all sharp angles and bur marks, forming the core in the general shape of the original tooth with all the undercuts and angles removed.

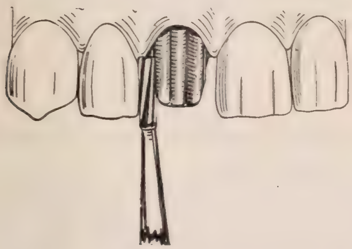


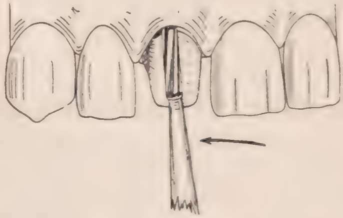


Avoid a regular cylinder or cone-shaped preparation which offers no support to prevent rotating the crown. The general shape of the original tooth offers the best resistance to the stress of mastication.

An impression tube is now to be filled with modelling compound, warmed thoroughly and pressed firmly to place, seeing that the tube passes beyond the shoulder and under the gum margin. Chill thoroughly and remove.

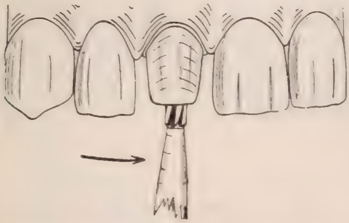
Accuracy in adaptation is obtained from the "tube" impression, but contour, occlusion and alignment depend upon a general impression showing several teeth on each side of the tooth to be crowned, both upper and lower. A carefully-taken bite, that is, an impression of both upper and lower, is better than separate impressions.

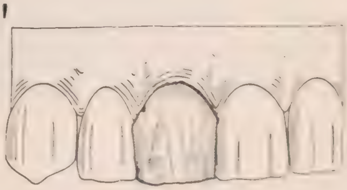




Extra tough pink base-plate wax is the best material to use for this purpose. Plaster crumbles and modelling compound either breaks or distorts where it may interlock under adjacent contacts, but this wax possesses enough rigidity combined with elasticity to "spring" out of the embrasures without distorting.

To get best results, mold a small piece of wax over the prepared tooth, pressing it down around the margin between the teeth. Chill and remove it once or twice to see that it may be slipped off easily, trimming down at the contacts if necessary. Replace it and take a "mush" bite over it, pressing the wax well over the surfaces of the teeth, both upper and lower. Chill thoroughly and remove. The heat of the wax bite unites the small piece of wax with the larger, producing an impression from which an accurate model may be obtained.





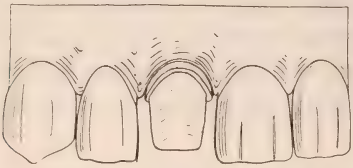
Cover the tooth with temporary stopping to protect the dentin from thermal shock and to keep the gum back until the crown is ready.

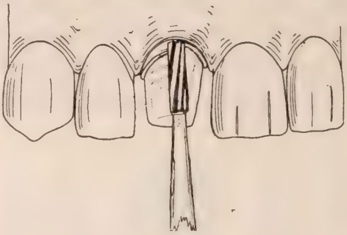
WHERE ARE PORCELAIN JACKETS INDICATED?

The statement that, "in any case where a crown is needed, a porcelain jacket crown may be used to better advantage than any other type of crown" is the best answer to that question.

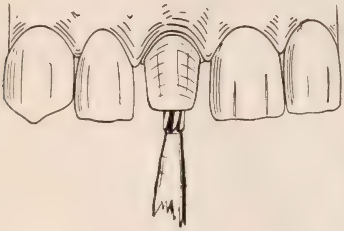
Second only in importance to saving the vitality of the pulp is the maintenance of healthy gum tissue and in both of these features the porcelain jacket crown stands supreme.

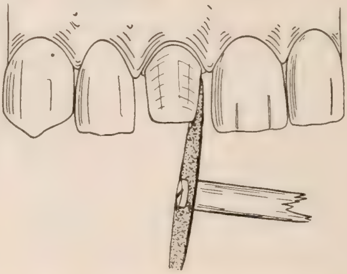
In nearly every case where a crown is needed and the pulp is vital, a good porcelain jacket crown preparation may be made without destroying the pulp. The exceptions are occasional irregular cases or where a tooth is fractured in the mouth of a young patient.

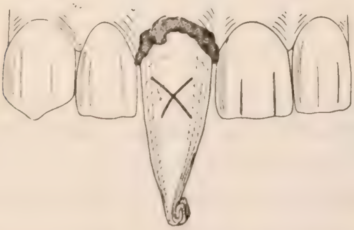


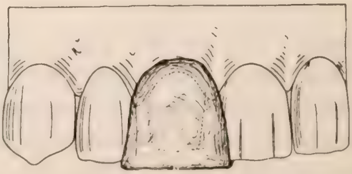


Where the pulp has been removed the core should be restored to normal form with a 22kt. casting. The metal restores only the central portion of the tooth, leaving the shoulder on the tooth structure. In cases where a "pin crown" has broken off and it is inadvisable to take out the pin, a shoulder may be extended at the periphery of the root which, with the pin, will be ample for retention and will present all the necessary conditions for a porcelain jacket crown.





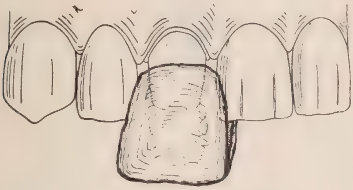


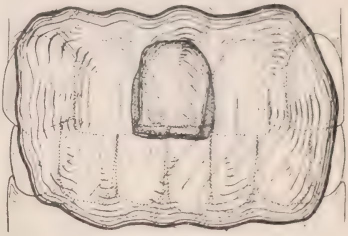


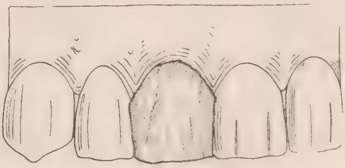
It is a well known fact that the gum tissue takes more kindly to porcelain than to any other material, and also that the presence of any metal, irregularity, overhanging edges or sharp margins causes pathological irritation and recession.

Coupling the tolerance of porcelain under the gum with the perfection of margin and correct reproduction of anatomical form that is possible only in porcelain jacket crown work, it stands beyond refutation that this work is the best that can be made.

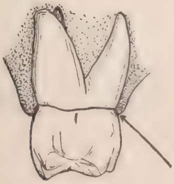
Jackets are, of course, especially indicated when restoring "peg" laterals, lower anteriors, discolored or malformed teeth and all anterior work, but they are equally valuable in molar and bicuspid work. Irregular articulations can be restored and the maintenance of anatomical form at the contacts, embrasures and gingival ridges are even more important to the health of the gum at the obscure posteriors than on the anterior surfaces where gingival irritation is more quickly observed and more easily corrected.

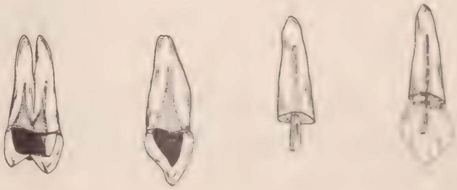






Years of continued service have proved the strength of porcelain jacket crowns. Where the principles of preparation as outlined in this treatise are followed, the percentage of breakage is so small that it may be discounted as negligible. Even in close-bite cases the preparation may be made so that lasting service will be assured with a properly made jacket.



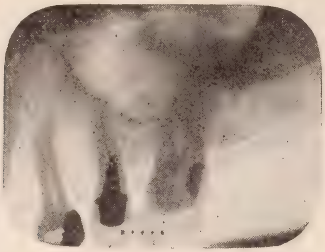


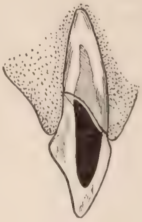
LIMITATION

To what extent are porcelain jackets practical in bridge work?

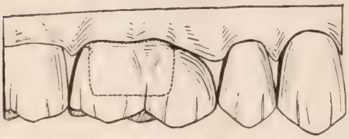
Summarily—Only in cases where a single dummy swung on a single crown, without further support, is indicated.

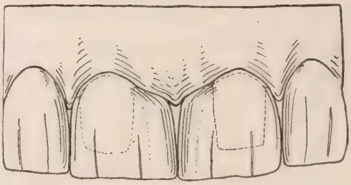
Where such a bridge is practical, a porcelain jacket crown with a dummy attached, carved of a single piece of porcelain, makes the cleanest, most esthetic, most beautiful restoration that can be constructed for that condition. It is *not* practical if the bite is strong or where further support is needed, such as a "lug" or other attachment.





The requirements are the same as for a single jacket except that the preparation must be more nearly ideal than would be possible for the smaller restoration. The technic of construction demands a "try-in" and second "bite impression" that are not necessary for single crowns.

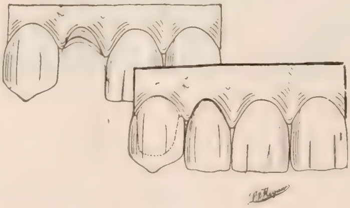




Spaced centrals

A small space often may be filled by exaggerating the contour of a single crown.

A bridge should be limited to no greater extent than a lateral swung on a strong cuspid.



The three-tooth bridge using porcelain jacket crowns as abutments has not proven practical in the writer's experience.

Mich. Boul. Bldg.

FINANCING BOTH ENDS OF A DENTAL PRACTICE*

BY GEORGE E. HARTER, TOLEDO, OHIO

IF IT WERE NOT MY OPINION that some of the matters barely touched upon in this effort are of at least equal importance to many of the technical matters discussed and disputed at most of our dental meetings, sometimes at very great length, the invitation to accept a place upon your program should have been declined, with, however, a very lively sense of the honor conferred by your Committee and its most worthy and courteous Chairman.

The average graduate in dentistry approaches the business world with that degree of childlike faith in and intelligent conception of the workings of Divine Providence as is displayed by a blind man eating chestnuts in the dark.

If it were not for the fact that this attitude of simple faith usually remains active during the life of the average professional man, despite the repeated warnings of experience, this paper need not have been given a place on your program.

If the average dentist took as much pains to take care of his money after he gets it as he takes—and gives—to earn it, he wouldn't need to worry about the future of himself and his family.

If your boy didn't take any better care of his bag of marbles than many of you seem to take of your dollars, he would keep you strapped of small change most the time buying more for him.

There was once a man who owned a balky horse. He traded the horse for a more or less decrepit shotgun. Traded the gun for a three-legged dog. Swapped the dog for a hen and a setting of eggs. Three of the eggs hatched, and the others proved to be stale. Two of the chicks were eaten by a skunk. The other tackled a better rooster and departed this life on the field of honor. What did the man have? Experience, an interesting life, no doubt; but this is just the reverse of what we call "business." To start with a rooster and end even with a balky horse—that's getting somewhere.

Dentists, as a rule, have capital a-plenty; but most of them seem to exercise no more common sense in the handling of it than did the man with the balky horse.

Of course, there are many exceptions to the rule. There are hundreds of dentists who can give me cards and spades and still beat me out. What is here said does not apply to them. But for all the others, whose name is legion, there may be something here worth having.

So much more depends upon the handling of money after it is earned than upon its acquirement that most of my time shall be devoted to that end of the subject. Do not believe that foolish philosopher who declares that nobody ever got rich by saving. Nobody ever accumulated a real fortune any other way.

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*Read before the Ohio State Dental Society, December, 1919.

Money must be valued, must be esteemed and respected, or it will take "the wings of the morning and fly away." It is the little-by-little that makes money valuable. Nothing ever was said or written that embodies more common-sense than "Come easy, go easy."

No matter how large your income may be; it is the amount that *you save* every day, every month, every year, that counts. Remember "Coal Oil Johnny?" He had a suddenly-acquired capital of millions, and an income of hundreds a day. He died a pauper. He bought every streetcar and cab that he rode in—they were a novelty to him—and then gave them to the drivers at the end of his trips. He bought the hotels and restaurants at which he ate his meals—and gave them to waiters or other diners with no more thought than you would apply to the tip you carelessly hand to the hat-girl. His millions lasted a year or two.

The expectation of life among dentists is not particularly high. If I were a life insurance agent, you probably should hear me say that it is lower than that of the members of any other profession. But high or low, long or short, there is a limit to the productive period in every life. Beyond that it is rare that any considerable amount is accumulated. To insure against want, later, something must be saved every year, every day, and made to earn an income.

Calculate the income necessary to keep you comfortably, according to your own ideas of comfort, after the productive period—say twenty-five to forty years of active effort. Divide the capital sum necessary to produce that income by the number of years likely to make up your productive period. This will give you the amount you must save every year, every day—*Then Save That Amount.*

You positively must learn to live within your net income, if you hope to belong to that elect very small per cent. of men over sixty who are not supported by their relatives or at public expense. If your income is only a thousand a year, save part of it, if you must live on oatmeal and molasses to do it.

There is a law that prevails in the lives of men that requires payment *in advance* for any kind of success. Energy, devotion, sacrifice, toil, self-denial are necessary to be deposited in the Bank of the Universe before it will honor your checks or my drafts drawn upon it. We must conquer the world or it will devour us and all we have.

Economy doesn't necessarily mean doing without. It certainly does not mean doing without the necessaries of life nor the means of earning a livelihood and a little more. It does mean *knowing what you want*, knowing why you want it, knowing how much it is worth *to you*, knowing whether its worth to you is equal to its price, and knowing whether or not you have the money of *your own* to pay for it. So—

Economy is not parsimony; it is spending money wisely and well.

If there is a man less worthy of esteem and respect than the Tightwad, it is the Spendthrift, who sows his money along the pathway of life, among thorns and thistles, where it cannot possibly do him or anybody else any good.

Spend your money as you please, for what you please, in any way that pleases you. But *please* don't spend it on impulse, or to gratify vanity or whim, or in order that somebody for whom you really care very little may think you "a good fellow"—and then complain that you can't make a decent living in the practice of dentistry. You cannot eat your cake and still have it.

Before you or any other man can have any money to spend, he must do two things: Earn it and then collect it. Dentists are professional men, or should be; and the attitude of the professional man toward the world, and particularly toward financial matters, does and necessarily must differ from the attitude of the non-professional man. And this difference of attitude must be genuine, real, heart-felt, and not merely assumed as a pose for effect.

Any attempt at any other attitude is sure to result in failure sooner or later. You know that physicians are called upon to subscribe to a pledge binding themselves to serve humanity to the best of their ability, regardless of reward. One of my closest friends for nearly thirty years was until his death a few years ago, dean of the faculty of one of our foremost medical colleges. From him I have the most emphatic statement that not one graduate who signed that pledge merely as a matter of form, or, as he expressed it, "Signed it with nothing but the end of his pen," ever succeeded, even financially, which, in his estimation, was the poorest form of success.

Genuine, whole-hearted, real desire to serve, to give all he can for what he gets, to the very best of his ability, is the one and the only correct attitude for the professional man. If he aims to get all he can for what he gives, if his ideal is acquisition and not service, he is not a professional man, no matter what college gave him his sheepskin. The violation of this Law of the Profession spells failure, as surely as does the violation of any other natural law.

"He profits most who serves best;" but *not* if he serve in order that he *may* profit. Service for the sake of service, not with an eye to profit, must be the law for the professional man.

The sin of Annanias was in pretending to serve—to give all—and keeping back part. In giving only enough service to "get by."

Remember what Paul said: "Brethren, the Absolute is not to be deceived. As ye sow, so also shall ye reap." We cannot pretend to be what we are not and be successful in it for very long.

Bread cast upon the waters—with a hook in it, merely as a bait, may return, but it will not bring with it the reward sought, and the eating of it will not be without bitterness. You all know how self-seeking in society matters brings reaction and disappointment.

"Give to the world the best you have, and the best will come back to you." But not if you give only a pretended best, and give that merely for the sake of getting.

For these reasons and many others, the place to begin collecting your accounts is at the chair by rendering real service, and—

By making your patients clearly understand what you are doing for them.

Satisfied patients usually pay promptly. Dissatisfied patients pay when they must—if they pay at all. And this quite regardless of the size of the fee.

Quality of service is remembered and *talked about* long after its cost is forgotten. Better have your patients call you "Robber" than "Bungler." They will not call you either *if* you have rendered real service and have made them understand what your service means to them.

Patients very seldom are driven away by excessive fees. Patients who leave you for that reason usually return, often bringing others with them.

Patients lost on account of poor service usually keep others away also. They are lost for good, their money is lost, and their friends are not added to your clientele.

Slipshod, sloppy service earns poor fees, and makes even those hard to collect.

The better class of patients—meaning those who understand, appreciate and are able and willing to pay for good service—never are attracted to the dentist who does as little as he can for the fee he charges.

I had rather try to collect pay for a dead horse than for poor dental service. The dead horse is gone, but the poor service is *right there* to speak for itself against its perpetrator.

As you regard yourself and your profession, so will your patients regard you. If your deepest interest is their welfare, they will absorb and reflect your attitude, and treat you accordingly.

"As a man thinketh in his heart—that is, as he feels himself to be—so is he."

Service is the only correct basis for fees—Service rendered for the sake of Service, not for the sake of fees.

You know what other dentists are doing for their patients, and you know also about what fees they are getting. If you know you are able to render equal or better service, you need not hesitate to make your fees equal to theirs. If you know you are *not* able to render equal service along all lines, better confine your practice to some specialty in which you know you can render service equal to the best. Otherwise there must be present with you always a sense of inefficiency, of giving less than the best; and that sense must rob your hands of their skill, and your mind of its intentness upon your operations.

Cost of materials used should be considered not at all, and time very little. *Results* only count in business, and nothing else should count in dentistry.

Fees based upon materials make merchants of professional men. Did you ever hear of a physician or surgeon who took materials into account?

Fees based upon time, penalize the rapid operator, and make time-servers and wage-earners of professional men.

The less of my time my dentist consumes, the easier it is for me to pay him.

Your attitude toward your patients with reference to your profession has just about everything to do with your success or failure as a professional man. When a new patient presents, never allow yourself to think of yourself as trying to "sell" him something. Assume the attitude of service from the first moment, and never allow yourself to depart from it for an instant. He must be made to realize that you are thinking for him, for his good, and that your fee is the last and the least in your thoughts.

Never ask a patient what he wants you to do. Make your own diagnosis and tell your patient what you purpose doing. Tell him, also, what results you hope to accomplish, and what those results will mean to him.

Having decided upon the operation that you consider best for your patient from every standpoint, perform that operation or none.

Did you ever hear of a general surgeon who would amputate an arm just because a patient wanted it done?

Better to lose a patient occasionally than to sacrifice your self-respect. Keep your ideals high, live up to them, and your fees need concern you very little.

Do not name definite fees in advance. In nearly every case you are practically certain to encounter conditions that cannot be foreseen. Besides, the practice of quoting prices encourages "shoppers."

If *you* think it positively necessary to quote fees in advance, make such prices approximate only, and always *higher* than you expect the charge to be. When bills are Lower than expected, payment is much easier than when they are Higher. If you expect to pay a hundred and your bill is but ninety—well, you know how it is!

Do *not* render itemized statements. They smack too much of the commercial spirit that seeks to gain favor that profit may follow. Your service should be your only claim upon the confidence and esteem of your patients.

Let your statements read like this:

"June 30. To Professional Services Rendered..............$40.00

"A detailed record of the service is on file in the office, and may be examined if desired."

A slip, or better, a card, neatly printed, should accompany each statement, something like this

> "Statements are rendered monthly, and payment is expected on or before the fifteenth of the month, whether the case is completed or otherwise."

Of course, all rules have their exceptions. Most of you have "regular" patients that may be depended upon to pay promptly on request, or even without request. These require special treatment. If the other sort don't pay promptly, send letters like the following, in the order given:

(On the fifteenth)

Dear Mr. Smith:

A statement of amount due for services was sent to you on the first of the month, requesting settlement on or before the fifteenth. You no doubt intended to remit promptly, but, as happens quite often, you probably laid the statement aside, and since have overlooked it.

Now that the matter is brought to your attention in this kindly manner, will you not dispose of it by prompt settlement? I assure you such action will be appreciated. Very truly,

(On the twentieth)

Dear Mr. Smith:

Statement of your account, showing an amount due of $40, was mailed to you on the first of the month. The matter was called to your attention on the fifteenth. Up to this time, remittance has not been received.

This letter is written to request settlement at this time, and I hope to hear from you promptly.

A return envelope is inclosed for your convenience.

Very truly,

(On the thirtieth)

Dear Mr. Smith:

My statement, mailed to your address on the first of the month, has been followed by two kindly requests for settlement of amount due, to none of which have I received response.

Overdue accounts are burdensome and costly, as you doubtless are well aware. As further time cannot be extended, immediate settlement is expected. Very truly,

(On the tenth of the following month)

Dear Mr. Smith:

I shall regret being compelled to force the payment of your account. Such action is likely to cause you embarrassment, inconvenience and expense, and I trust you will not compel me to resort to that extreme.

You can spare both yourself and me this disagreeable experience only by making settlement not later than the seventeenth.

Very truly,

A true Kentuckian never reaches for his gun unless he means to use it. Be a Kentuckian. If your fourth request brings no response, hand the account to an attorney who has the reputation of getting results. It is then out of your hands. Refuse settlement even if offered except through your attorney. Make your slow-pay fellows understand that you mean what you say.

Of course, there may be many cases in which prompt payment is impossible; but there cannot be a case in which a debtor cannot write, or call, or phone, or send a friend to explain his delay. Your action is retribution for his carelessness, indifference, or dishonesty; not for his inability to pay.

Of course, you should have a card system or some form of what we call a "tickler," on which a record of your collection experience must be kept. You want to know, and you very particularly do not want to send a collection letter to a man after he has paid.

You should take all reasonable precautions to prevent the necessity of forced collections. You don't like them, neither do your patients; and the chances are that collections so made will cost you at least one patient. Learn the reputation and standing of your new patients before rendering more than preliminary service.

If there is a Credit Agency in town, become a subscriber. Inquire concerning every new patient not personally known to you immediately after first sitting. That's what your merchant would do if you asked him to open an account. If there is none, ask the drygoods man; he is likely to know, and he'll tell you if you have cultivated friendly relations with him, as you should do. Or—Ask your banker.

Maybe you haven't a banker; it is even possible that you are rather afraid of banks and bankers. You couldn't possibly make a greater mistake. Banks and bankers are interested in everything and everybody in a community that is constructive—that helps to build up. That's their business. Business friendship is the stock-in-trade of a banker. If you haven't made a business friend of some banker, let that be your first act as soon as you get home. You probably have lost more than you can afford on account of your mistaken attitude.

Select the bank that looks most "human" to you. If all look alike to you, select the one that does the most business. If you don't know, find out by inquiring.

Call on your banker; tell him that you would like to know him; that you want to know his bank, because you expect to use it hereafter; that you should have done so earlier, but somehow you hadn't just the right slant on things. Tell him that from that day on you mean to deposit every dollar you earn in his bank; that you are going to pay all bills over one dollar by check; and then *Do Those Things*.

Deposit *all* of your receipts in full every day. *All—In Full—Every Day*. Make a deposit of the sum total of your receipts in that bank every business day of the year. If you pass a day without receiving any money, you need not make a deposit that day! But see to it that you do not pass any other days.

Do not spend a dollar that has not passed through your bank. See that every dollar you spend for supplies, for help, for rent, for fuel, for living expenses—yes, and for "that friendly little game," first passes through that bank of yours.

Pay all bills of $1.00 and over by check. Draw checks for the amount you need in the office to pay petty bills—express charges, telegrams, postage. Draw personal checks for the amount you want to carry around in your pocket. Draw checks to cover household expenses—draw these in favor of Mme. Mary Dentist; have *her* deposit them to *her own* account, and let her pay household bills. You'll live better for less money, and save yourself the endless fret of paying a lot of small bills; and you'll give her a start in business training for which she will thank you—after you're gone, if not before.

Always fill up the stub of the check before you write the check. Be sure to carry your net balance in bank along from stub to stub. Why? So that you may avoid overdrawing your account—and, maybe, getting in bad with your banker. Banks don't like overdrafts. Overdrafts are simply enforced loans; that is, if the bank pays them. Some will and some will not. They are unfair to you and unfair to your bank. Unfair to yourself because they give you a bad reputation at the bank; unfair to the bank, because you take the loan without asking for it, and pay no interest. Unfair to yourself, because you are pretty certain to want a loan sometime, and then the bank is likely to remember that overdraft and not feel any too kindly about it.

Banks like accuracy and promptness. So do I. So do all business men. So will you, once you form the habit. It will make you rich.

Carrying your net balance along on the stubs in your checkbook is likely to save you a lot of money in a year. If you *know* your balance is only a hundred dollars you are less likely to lend John that ten he wants for a "stack of blues, or somethin'," and are not at all likely to take a chance on the goodness of Providence. I have found that Providence takes best care of the man who carries the biggest bank balance.

Do you know what your net income is? Well, it's that part of your income or earnings that does not belong to somebody who has supplied you with instruments, equipment or supplies to be used in your practice. You have no right to use that part of your income. You hold that *in trust* for the man who has trusted you, just precisely as part of my income belongs to my grocer who has trusted me with the food I need.

You cannot know anything about your net income unless you keep a record. Such a record must show all of your receipts, and it must show all of your disbursements or payments. A few years ago I would have contented myself with the statement just made, and then tried to show you why you should keep such a record for your own sake. Now it is different. Uncle Sam has stepped in, and you simply *must* keep a record if you want to avoid trouble. Here's what *he* says about it:

COPY OF LETTER FROM DANIEL C. LOPER,
COMMISSIONER OF INTERNAL REVENUE

Bureau of Internal Revenue, Washington, D. C.

1. The revenue act is expected to produce $8,000,000,000. This means a tax on the average of more than $76.00 for every man, woman and child in America. The average per family is nearly $340.

2. In many businesses taxes will be one of the largest items of expense. It is of the utmost importance, therefore, that every concern, large or small, whether corporation, partnership or individual, shall maintain an exact record of its receipts and expenses, in other words, keep accurate accounts. Taxes should be considered as an expense of the year for which they are assessed rather than for the year in which they are actually paid and the necessary reserves should be provided for at once.

3. Because of the large amounts to be collected, the Bureau of Internal Revenue will be compelled to check the income tax returns filed by taxpayers more closely than heretofore. The man who is able to place before the Internal Revenue Inspector book records showing exactly how he arrived at his statement of net income will greatly facilitate the Government's task of collecting the war revenue and save himself annoyance and expense.

4. No special system of accounts is prescribed by the Internal Revenue Bureau; but the books should show in detail, inventories, purchases, sales, capital investments, depreciation, and similar items required in making up the income tax return. Every merchant should study the income tax law and regulations and see to it that his accounts are kept in a manner that will enable him to determine his net income for taxation purposes.

5. Aside from the necessity of keeping systematic accounts in order to comply with the Government's requirements, every progressive individual should adopt an approved accounting system for the good of his own business. In no other way can he further his financial interests more effectively. It has been proven time and time again that accurate accounts are absolutely essential to success in business. The man who has a good accounting system is able to eliminate waste and unnecessary expense.

6. The profits of a business or the losses of a business cannot be determined without book records; and now that the Nation requires

every citizen to contribute within his means and income, the returns required by the Government under the revenue laws cannot be made with any degree of accuracy without books of account and annual inventories.

7. The man who knows the exact condition of his business from day to day has an immeasurable advantage over the individual who has no records upon which to base his operations. It is the duty of every citizen especially in these times to keep in such close touch with his business through record keeping and otherwise as to maintain the greatest efficiency and render to his Government every cent due in taxes.

So, you see, you really have no option in the matter of keeping a record. Uncle Sam doesn't say *you must*, but he does say that you are very likely to get into trouble if you don't.

Any kind of record, kept correctly and in sufficient detail, will do. I'm not here to try to sell anything; but I do want to show you a record "as is" a record. It will be thrown on the screen presently. It was designed by cooperation between a dentist who also was a business man, and accountants of long experience in the dental business, who know the needs of the profession as well as any man living.

Now, we have been over several phases of the business end of the dental game, but what I consider the most important is still to come. You have patiently listened to what has been said about earnings, collections and record-keeping. But what I consider the most important part of the whole business is still to come.

What are you going to do with your money after you get it?

Feed it to the birds, or what?

Do you know that *all* professional men, even lawyers, are considered "Easy Marks" by the confidence-man and gold-brick artist? Do you know that of all Easy Marks the dentist is considered the easiest of all?

It would be interesting to know how many gold mines, oil wells, fruit farms, rubber plantations, copper mines and blue-sky generally, dentists have bought and paid for—for the other fellow.

Speculation is an interesting game, a very attractive and enticing game, but very few men have just the right gambling spirit to sit in and enjoy the game for its own sake. If *you* haven't just that particular and peculiar organization better keep out. Few professional men have it. They go in, hoping and expecting to win some easy money, and loss hurts.

Unless you know that you will enjoy losing almost as much as winning, let others "hold the bag." That's what it amounts to—just about.

In case of doubt, do nothing.

Of course, there are plenty of good speculative investments. Many men have grown rich that way—even some dentists. But the chances are about a thousand to one that *you* will not.

Remember this: No good opportunity *ever* goes begging for money. Money is standing waiting for every such opportunity. There is enough idle money in Colorado to finance every good mining prospect in that state; there is enough money seeking investment in the city of New York to back up to success every reasonably safe proposition. If a scheme offers a fair prospect of success, home money will take care of it. *You* never need hope for a chance at the really good things a thousand miles away.

If a proposition is not good enough for those on the ground, it surely isn't good enough for a professional man who knows about as much about speculation as a Brazilian monkey knows about the laws of the Medes and Persians.

Better be *safe* than sorry.

Keep your money fluid, ready for quick action when some good *local* opportunity comes your way—something that you and your friends know all about—*and that your banker can recommend.* This is another service that you can render to yourself by making a friend of a banker.

Beware of *anything* offering unusual returns. Investments paying twenty, thirty, fifty, a hundred per cent. do not grow on elder-bushes. If they did, there would be somebody right there with a pair of shears.

I know of several cases in which dentists have died almost paupers, leaving safes stuffed with worthless stocks and such. In two such cases the funeral expenses had to be met by contributions. Better be satisfied with investments that promise smaller returns—and *keep their promises.*

Sympathy is a fine sentiment; but it is better to be respected than pitied after one is dead. You don't want the neighbors to say at *your* funeral: "He was such a fine man; what a pity he didn't know how to take care of his money. What his wife and family are going to do, the Lord only knows." And this after a life spent at the dental chair; the hardest job I know anything about.

Never invest a dollar in anything offered you by strangers.

Never invest a dollar without frankly consulting your banker, or a business friend.

Never do business of any kind with people of whom you know nothing, unless they come to you fully identified and vouched for by somebody that you do know. Then confirm that identification.

Let the *other* good fellow cash checks for strangers.

Let the other fellow loan money to anybody and everybody, without security. Don't *you* do it, except to help out a sure-enough friend whom you know all about. And, when you do it, just make up your mind that the loan is a gift and kiss it goodbye. You'll feel better about it than if you allow yourself to count upon its return in time to meet some bill or other, and find yourself disappointed, as you are pretty sure to be. Then, if it does come home, you'll feel as though you had found something, and be entitled to the little celebration you are sure to have, if only in your mind.

Just a caution: Be especially careful how you handle money that you didn't expect to get. Ever find a ten-dollar bill or something like that? Remember how you let down the bars and left them down until you had spent that tenner over and over again—maybe a dozen times? Better make a special trip to the bank and get *that* money out of sight so it can't tempt you to spend it.

Be very careful how you endorse paper or make yourself surety for anybody without some form of indemnity that will protect you and your family. Yes, of course; John is all right; you *know* he will take care of you; he never, never will let you "get stuck" for that note, or that contract, or that some-thing-or-other. That's just precisely what some hundreds of thousands of other good men and steady earners have thought when some friend has asked them to stick their necks into some form of financial noose that has strangled them later on.

Remember, always, that you are almost certain to be called upon to make good for every such obligation you incur. It is *your* name that has secured the credit; *you* are the responsible party to the transaction. If you are able and willing to pay, without injustice to yourself, your family, your creditors, well and good; it is then nobody's business except your own.

I spoke of something that might indemnify you—protect you against loss. It's a poor sort of man who hasn't something he can turn over to a friend to hold as surety against loss on account of an endorsement—Liberty Bonds or something. If the one who asks you to "go his security" hasn't anything of the kind, and you simply must help him, better hand him the money and be done with it. It will save you a lot of worry later on.

Never allow anybody to owe you more than you are able to lose. And the best time to avoid that condition is before the debt to you is incurred. We are not considering fees particularly just now, but loans and other debts.

Never allow yourself to owe anybody more than you easily are able to pay. This means: Do not incur debts for automobiles, pianos, houses and lots, or anything, that will keep you fussing and squirming. You cannot do your best in that condition, and it is going to take your very best to make good in your practice from now on—we've already agreed to that, haven't we?

Be as liberal as you like—but *calculate*. Think out your money problems and then act according to the result of your calculation. Don't be stampeded or rushed into anything.

There are two mighty good ways to lose a friend: Beat him out of money is one way. Let him beat you out of money is the other.

Handle your household expenditures rationally. Don't allow bills to run helter skelter of their own sweet will. Talk it over with the Better Half. Tell her you want to establish a budget for next year. Ask her how much she needs to "run the house," clothe herself and the children, etc. After you have agreed on the amount, better add a hundred or so to it, to be on the safe side.

Try to get her to understand and realize that you are talking business; that you will hold her to the estimate for one full year, no matter how much your income may increase, and no matter how much more she may think she needs later on.

Tell her that you want to know, and that you want *her* to know, how it feels to be ahead of the game *just once.*

Draw your check payable to Mrs. Sally Dentist every month for the amount agreed upon; and have her pay all bills included in your estimate; and pay them by check against her own account. If you never have tried the budget system, you have a good time ahead of you. You rid yourself of the annoyance of paying a lot of little bills, and you add to her fondness for you by making her independent. No wife likes to run to her husband every time she wants a dollar or two. Of course, if she proves to be incapable of taking care of her end of it, you will need to change; but most of them can do it better than we can, bless 'em, because little things don't annoy them as they do us.

Make a budget for yourself, also. Pay yourself a salary, precisely as though you were working for another man. And don't allow yourself to exceed that, either. Draw checks against your business account, payable to yourself, personally, for your monthly salary, and deposit them in another account, even in another bank, if you prefer. The idea is to keep your personal expenses and your business obligations and earnings entirely separate.

Pay all local bills by check. Why? Well, you want to be known in your own home town, don't you? If you live in a place over a few hundred population, and always pay cash as you go along, you may live there a hundred years and never be known to anybody except a few neighbors, and maybe the butcher, the baker and the candle-stick maker. If you pay by check, hundreds of worth while people will know you. Pay material and equipment bills by check or draft against your business account.

Have all personal bills charged to your personal account, or to the personal account of your wife. Pay *promptly* on receipt of bills or statements if you want to be favorably known. That is the way to establish a credit.

Keep your credit and your credit will keep you.

Use your credit, never abuse it. Business men make their terms to suit conditions under which they are obliged to do business. Long credits are the rule in some lines; short credits in other lines. *If* you use credit, always conform to the terms made by the house from which you buy, knowing that they were made in order that that particular concern might remain in business profitably.

Make your own terms for your services, and see that your debtors conform to them.

Always estimate your expenses higher than you really expect them to be. Not very much necessarily, but enough to leave a comfortable margin. Then you are not likely to be disappointed.

Never buy anything because it is cheap. Unless you need it, anything is dear at any price.

Try always to be pessimistic with regard to financial matters. If prospects seem too rosy, divide them by two and then persuade yourself that half of that will be good enough.

Try to educate yourself up to the point of taking at least as good care of your dollars as your boy does of his marbles, and you will save yourself many embarrassing situations, and feel that you really are taking care of yourself and the future of your family.

Get as close to your dealer as you can. Any attempt to bring about antagonism between you and your dealer should be frowned upon as suicidal. Your interests are mutual and identical.

RELATION OF AUTOINTOXICATION TO MOUTH CONDITIONS, PARTICULARLY PYORRHEA ALVEOLARIS*

BY ARTHUR VOS, M.D., CINCINNATI, OHIO

NOTWITHSTANDING THE FACT that the mouth is probably the most used and most abused organ of the body, it is nevertheless, strictly speaking, subject to fewer abnormal and diseased conditions than perhaps any other organ of the body. In the healthy new-born infant the mouth is stated to be free from micro-organisms and very few are found in the breast-fed baby. But it does not take long, especially with the first dentition or shortly afterwards, when the infant is fed all kinds of food, before every variety and form of micro-organisms can be found. More than seventy varieties of bacteria have been isolated from the mouths of healthy people. In view of this fact it would appear that the activity of these micro-organisms is only one of the factors in the production of the various diseases of the mouth cavity. We shall refer to this statement at greater length and more in detail in the subsequent discussion.

One or two other fundamentals must here be considered. The first of these is the fact that the saliva is not an antiseptic, for its inhibitory influence if it exerts any at all on the growth of micro-organisms, is chiefly mechanical, the organisms being prevented from becoming fixed, are soon swallowed and do not find the means for multiplication in the mouth. So slight are the antiseptic properties of saliva that an increased flow of it, while mechanically beneficial in washing away organisms and decomposing material, fails to check any acute ulcerative processes. Tartar with organisms for instance, is prone to collect around the lower front teeth, although these are especially bathed with saliva and the sulphocyanate of potassium included in the chemical constituents of this digestive juice can hardly exert any antiseptic properties. On the other hand, the only ferment in the saliva, ptyalin, has simply an amylolytic action and not an antiseptic one.

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*Read before Cincinnati Dental Society.

The second fundamental to be considered here has reference to the functions of the mouth. Probably no organ of the body is so versatile in its activities as the mouth, for it possesses the capabilities of performing at least six different functions. By virtue of the teeth, tongue, and cheeks it performs the functions of a grist mill. Through the tongue and teeth the articulate elements of speech are formed. The amylolytic properties of the salivary glands act as the first stage in the process of the digestion of food and the mucous membrane of the mouth has the power of absorption similar to that of every other mucous membrane in the entire alimentary tract. In this respect the mouth performs the function of assimilation though in a mild degree. Strange as it may seem, nevertheless it is true that the salivary glands together with the tonsils have an excretory function of no mean value, whereby certain products of decomposition and autointoxication are cast out of the body. Lastly, although not strictly speaking a respiratory organ, the mouth performs the contingent and compensatory function of respiration not only when forced breathing is brought on by great muscular exertion, but in those cases where the nasal passages are occluded through either disease or accident.

In view of these fundamentals, namely, the facts not only that the mouth is the most frequently germ-invested organ of the body and the most used and abused organ, one would expect, especially if the germ theory of disease as now interpreted and understood were true, to find the mouth the most frequent seat of disease. But far from finding this to be the case, the paucity of diseased conditions is so marked that it is difficult to select a diseased condition of the entire mouth cavity that will sufficiently illustrate the relation between it and that general state of the body that we call autointoxication. However, because of its nature it serves our purpose very well to discuss pyorrhea alveolaris by pointing out its essentially constitutional nature, its course and its cure, in order to show the simplicity of it all.

Pyorrhea alveolaris is one of those conditions that has gained a rather modern reputation. The older writers pretended to know little or nothing about it, and in many modern books pyorrhea alveolaris is given very little attention. Thus Allbutt's System, Nothnagel's Encyclopedia, Flint, Fagge and even Osler do not mention a word about it. Pyorrhea alveolaris is also called Riggs' disease, but even the tenth edition Encyclopedia Britannica is silent as to both Riggs and the disease that he first described. The only work in which I find any specific reference to pyorrhea alveolaris is the Twentieth Century Practice of Medicine, Volume 9, page 17. This work was published in 1897, twenty-two years ago. In order to give you a concept of what was known at that time of this disease I am giving you the entire article.

"*Diseases of the Gums.* In a number of forms of stomatitis, especially in those which proceed from bad teeth, the gums are the principal, sometimes the sole part of the mucous membrane of the mouth which is affected. These diseases already have been noticed in the sections on stomatitis simplex, stomatitis ulcerosa, tuberculosis, syphilis, and actinomycosis in the article on general diseases of the mouth in Vol. 8.

"*Pyorrhea Alveolaris.* This is a form of inflammation peculiar to the gums and requires a special description. The affection occurs, as a rule, in patients who are past their thirtieth year, and is generally the result of neglect of the teeth, but sometimes is met with when the teeth are properly cleaned, if tartar accumulates readily upon them. The incisors and the anterior molars are generally the first and most seriously affected. The upper teeth are more frequently attacked than the lower.

"The commencement of the disease is insidious. As a rule, the patients have noticed for months or years a loosening and a slight painfulness of the gum and a certain tendency to hemorrhage. A sensation of slight tension being now experienced, the characteristic symptom develops—the formation of small foci of suppuration between the gum and the neck of the tooth. These are emptied easily by pressure on the gum, a small greenish-yellow, generally not fetid, drop of pus appearing upon the edge of the gum. A fine probe inserted at the point of exit of such a drop of pus penetrates far along the neck of the tooth without encountering any resistance; the periosteum of the jaw at first, at least, is intact. At the beginning of the affection, the tooth itself which very often is quite healthy, is still firmly fixed in its alveolus, but in the further course of the disease it becomes more and more loosened and finally whole rows of teeth may become loose and may even fall out without showing a trace of caries.

"This happens the more easily because the disease is often quite overlooked or misunderstood by the patient and unfortunately often by the physician also, so that many a tooth, itself sound, falls a victim to this neglect; and that, too, although with a little attention an error of diagnosis or failure to recognize the presence of the disease is hardly possible.

"The treatment must be vigorous. Astringent and antiseptic mouth washes which as a rule are prescribed, are of little or no use. On the other hand the removal of an otherwise sound tooth, which frequently is advised, is decidedly to be reprobated. The proper treatment is to divide the gum over the whole extent of the neck of the tooth. This operation which must be performed conscientiously upon all the affected teeth often demands the exercise of some patience. The procedure is made easier for the patient by the application of cocain to the gums. After the little abscesses are laid open in this way, the cavities thus produced must be thoroughly rubbed with iodoform and afterwards if necessary packed with small strips of iodoform gauze.

"Under this simple treatment the disease is completely cured in a few weeks at the longest, but the operation frequently requires to be repeated after two or three weeks, and even in especially obstinate cases to be done a third time. Often teeth which are already much loosened become firmly fixed in their sockets again and are preserved indefinitely by the patient. A knowledge of and attention to this in its symptoms of trivial affection, is of great importance on account of the ease with which good results in the treatment are obtained."

In *The Journal of the National Dental Association*, for May, 1919, I find an article by Dr. P. R. Howe, of Boston, Massachusetts, on "Experimental Pyorrhea," with which, in the main I agree. His conclusions are pretty much as follows, to wit: That the theory that pyorrhea is caused by bacterial invasion, though prominent at the present time, is untenable for the simple reasons: (a) that infection must be preceded by chemical or mechanical tissue disturbance, by trauma, by constitutional effects due to nervous or anomalous metabolic conditions; (b) nothing can be expected from vaccines because of the fact that the infective part of pyorrhea is a secondary matter in its pathology; (c) the character of foods in the control of dental disturbance is undoubtedly a matter of great importance as all our knowledge of caries points to an unbalanced diet, perhaps a deficient diet together with other factors; (d) tartar formation is as much a constitutional matter as a local one; (e) that as a rule pyorrhea is a disease of the adult; (f) that house-fed dogs have it extensively. (g) that it accompanies certain diseases or irregular matabolic states, such as diabetes, alcoholism and syphilis; (h) that it follows disturbances of the glands of internal secretion and chemical and mechanical trauma; (i) finally that oral conditions are directly dependable upon an infinite number of systemic changes." Now here we have some light. But just *some* light. Not *all* light. Not even enough light to help us out of the difficulty.

Let us now consider pyorrhea alveolaris more closely, for it is representative in its manifestations, according to my ideas, of a whole host of diseases. Pyorrhea alveolaris is, like all diseases, a filth disease, a dirt disease. By this filth and dirt we have reference to the filth and dirt in the blood and in the tissues, which filth and dirt is commonly called autointoxincation and which is in fact the superfluous, unused, unassimilated and unusable food and debris that is circulating in the blood and the various tissues of the body. This is the constitutional side of pyorrhea, the side that, in my judgment, is common to tonsilitis, to otitis media, to appendicitis, to rheumatism, to tuberculosis, to syphilis. The local side of pyorrhea alveolaris is filth too, for there is lack of oral hygiene—lack of local cleanliness. When food material gets lodged between the teeth and gums it will, by virtue and through the presence of manifold local bacteria, decompose, and if the decomposition is of sufficient activity it will set up a similar process of decomposition in cells and tissues already in a devitalized state from irritation through the blood stream inside the body. That is the thing to be remembered—the consitutional state now called acidosis, a condition due to constant fermentation and putrefaction of foods in the gastro-intestinal tract, before this disease can possibly arise. When men and women get in this state of health, if they are careless and diffident about the care of their gums and teeth, pyorrhea is more than likely to develop. Of course, though it is true that autointoxication is the base of all types of diseases, it is heredity, disposition and character that control the type of disease that will develop in any particular individual. A manner of living that breaks down resistance is likely to start the patient off on gout, rheumatism, arteriosclerosis, tuberculosis, gall-stones or even stone in the kidneys. The reason therefore why one person develops pyorrhea and another develops say, rheumatism, is simply because there is either an inherited or constitutional tendency to take on these diseases. This view is contrary to that accepted by Modern Medical Science which says or would say, that every disease develops a symptomatology in accordance with, and in correspondence to, the life activity of a specific germ. The burden of proof regarding this assertion rests with the modern germ theorists who are required not only to demonstrate correspondent life cycles in specific organisms, but who must also give an explanation of the etiology and symptomatology of those diseases for which no specific organisms have as yet been isolated.

Pyorrhea alveolaris can therefore, according to our view, never be found in any man or woman who has normal digestion and assimilation and consequently a perfect state of metabolism. In fact we never find anything the matter with the teeth or gums of any man, woman or child who has a normal digestion and assimilation. It is always a perverted state of nutrition and assimilation that has as one of its symptoms decaying teeth, inflammed gums and receding tissues. Those who have developed pyorrhea alveolaris have lived haphazardly and have failed to take in their diet the necessary constituents that go for the reconstruction of hard, resistant and bony structures. For the most part they have lived on a one-sided diet, preferring meats and starches to the neglect of fruits, succulent vegetables and salad foods. The resemblance of pyorrhea alveolaris to the old time scurvy is indeed more than coincidental.

We shall quote the following from Osler on the symptoms of scurvy to show a most remarkable analogy between the two diseases.

Symptoms. "The disease (scurvy) is insidious in its onset. Early symptoms are loss in weight, progressively-developing weakness and pallor. Very soon the gums are noticed to be swollen and spongy, to bleed easily, and in extreme cases to present a fungus appearance. These changes regarded as characteristic are sometimes absent. The teeth may become loose and even fall out. The breath is excessively foul. The tongue is swollen, but may be red and not much furred. The salivary glands are occasionally enlarged. Hemorrhages beneath the mucous membranes of the mouth are common. The skin becomes dry and rough and acchymoses soon appear, first on the legs and then on the arms and trunk and particularly into and about the hair follicles. They are petechial but may become larger, and when subcutaneous may cause distinct swellings; in severe cases particularly in the legs, there may be effusion between the periosteum and the bone forming irregular nodes, which, in the case of a sailor from a whaling vessel who came under my observation, had broken down and formed foul-looking sores. The slightest bruise or injury causes hemorrhages into the injured part. Oedema about the ankles is common. The 'scurvy sclerosis' seen oftenest in the legs is a remarkable infiltration of the subcutaneous tissue and muscles, forming a brawny induration, the skin over which may be blood-stained. Hemorrhages from the mucous membranes are less constant symptoms; epistaxis is, however, frequent. Hæmyptysis and hæmatemosis are uncommon. Hæmaturia and bleeding from the bowels may be present in very severe cases.

"Palpitation of the heart, feebleness and irregularity of the impulse are prominent symptoms. A hæmic murmur usually can be heard at the base. Hæmorrhagic infarction of the lungs and spleen has been described. Respiratory symptoms are not common. The appetite is impaired, and owing to the soreness of the gums the patient is unable to chew the food. Constipation is more frequent than diarrhoea. Pain, tenderness, or swelling in the joints were present in thirteen of McGrew's forty-two cases. The urine often is albuminous; the changes in its composition are not constant; the specific gravity is high; the color is deeper and the phosphates are increased. The statements with reference to the inorganic constituents are contradictory. Some say the phosphates and potash are deficient, others that they are increased.

"There are mental depression, indifference, in some cases headache, and in the later stages delirium. Cases of convulsions, of hemiplegia, and of meningeal hemorrhage have been described. Remarkable ocular symptoms are occasionally met with, such as night-blindness or day-blindness.

"In advanced cases necrosis of the bones may occur, and in young persons even separation of the epiphysis. There are instances in which the cartilages have separated from the sternum. The callus of a recently-repaired fracture has been known to undergo destruction. Fever is not present except in the later stages, or when secondary inflammations in the internal organs appear. The temperature may be below normal sometimes. Acute arthritis is an occasional complication."

Now, it would seem that such a protean array of symptoms, an array that puzzled the old-time physicians of a century or two ago for want of an explanation, must be caused by some, if not by a host of germs of a most malignant type! But germs have been proven not to be the cause of scurvy as the following quotation on the etiology of "Scurvy" from Osler, page 821 will show.

Etiology. "The disease has been known from the earliest times and has prevailed particularly in armies in the field and among sailors on long voyages.

"From the early part of this century, owing to the efforts of Lind, and to a knowledge of the conditions upon which the disease depends, scurvy gradually has disappeared from the naval service. In the mercantile marine cases still occasionally occur owing to the lack of proper and suitable food.

"The disease develops whenever individuals have subsisted for prolonged periods upon a diet in which fresh vegetables or their substitutes are lacking. An insufficient diet appears to be an essential element in the disease, and all observers are now unanimous that it is the absence of those ingredients in the food which are supplied by fresh vegetables. What these contituents are has not yet been definitely determined. Garrod holds that the defect is in the absence of the potassic salts. Others believe that the essential factor is the absence of the organic salts present in fruits and vegetables. Ralfe, who has made a very careful study of the subject, believes that the absence from the food of the malates, citrates and lactates reduced the alkalinity of the blood which depends upon the carbonate directly derived from these salts. This diminished alkalinity gradually produced in the scurvy patients is he believes, identical with the effect which can be artificially produced in animals by feeding them with an excess of acid salts; the nutrition is impaired, there are acchymoses and profound alterations in the characters of the blood. The acidity of the urine is greatly reduced and the alkaline phosphates are diminished in amount. One of the most interesting of recent facts relating to scurvy has been the great frequency of it in children, in connection, as a rule, with improper diet. It will be referred to more fully in a subsection.

"In opposition to this chemical view it has been urged that the disease really depends upon a specific (as yet unknown) micro-organism."

In the United States scurvy has become a very rare disease. To the hospitals in the seaport towns, sailors are now and then admitted with it. In large almshouses outbreaks occasionally occur. A very great increase of foreign population of a low grade has in certain districts made the disease not at all uncommon. In the mining districts of Pennsylvania, the Hungarian, Bohemian and Italian settlers are not infrequently attacked. McGrew recently has reported forty-two cases in Chicago, limited entirely to Poles; he ascertained that in a large proportion of the cases the diet was composed of bread, strong coffee and meat. Occasionally one meets with scurvy among quite well-to-do people. One of the most characteristic cases I ever have seen was in a woman with chronic dyspepsia, who had lived for many months chiefly on tea and bread. Some years ago scurvy was not infrequent in the large lumbering camps in the Ottawa Valley. Judging from the report of the American Pediatric Society we must infer that infantile scurvy is on the increase in this country.

"In parts of Russia scurvy is endemic, at certain seasons reaching epidemic proportions, and the leading authorities upon the disorder, in that country, are almost unanimous, according to Hoffmann, in regarding it as infectious."

"Other factors play an important part in the disease, particularly physical and moral influences—overcrowding, dwelling in cold, damp quarters, and prolonged fatigue under depressing influences, as during the retreat of an army. Among prisoners, mental depression plays an important role. It is stated that epidemics of the disease have broken out in the French convict ships en route to New Caledonia even when diet was amply sufficient. Nostalgia is sometimes an important element. It is an interesting fact that prolonged starvation in itself does not necessarily cause scurvy. Not one of the professional fasters of late years has displayed any scorbutic symptom. The disease attacks all ages, but the old are more susceptible to it. Sex has no special influence, but during the siege of Paris it was noted that the males attacked were greatly in excess of the females."

The remaining diseases of the mouth are: *First*, acute stomatitis of a simple or erythemecetous nature; *second*, aphthous stomatitis known also as follicular or vesicular stomatitis found mostly in children; no special parasite has been found in connection with it; *third*, ulcerative stomatitis or fetid stomatitis, sometimes called putrid sore mouth which occurs in children after the first dentition; ulcers are crescentic in shape; chlorate of potash has been found almost specific; *fourth*, parasite stomatitis or thrush, most commonly seen in children and supposed to depend upon the fungus saccharomyces albecans, a yeast fungus; *fifth*, gangrenous stomatitis called cancrumoris or noma, an affection characterized by a rapidly-progressing grangene, starting on the gums or cheeks and leading to extensive sloughing and destruction. This disease is seen only in children under unsanitary conditions and is many times fatal. Mercurial stomatitis or ptyalesin; *sixth,* geographic tongue, a form of eczema; *seventh,* leucoplakia buccalis a form of skeralosis. These conditions are one and all due to autointoxication in the same way as pyorrhea is. Remove the autointoxication and there is no chance for these conditions to develop.

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THE RELATION OF BIOLOGY AND DENTISTRY*

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WHEN, FOUR YEARS AGO, the standard course in dental schools was increased from three to four years, the subject of biology was introduced into the first year of the dental curriculum.

The experience with entering students during the past four years, shows that some dental students feel that the subject of biology is not essential to the dental curriculum, that it is indeed a rather useless ornament, and that the time occupied by it could be used to better advantage on technical or clinical work.

This opinion as expressed by these students is found, on inquiry, to be in most cases a reflection of the opinion of a dental practitioner who stands in the role of advisor to the student.

It therefore seems worth while to discuss the advantage to the dental student of a formal course in biology, given early in his student career.

Quite aside from the fact that every individual who attains to any degree of education, should, for his own pleasure and benefit, know something of biological phenomena, there is to the dental student and to the dentist a very distinct utilitarian factor in an elementary knowledge of biology.

The dental profession has passed the time when its only aspiration was to be skilled in mechanical manipulation. It has reached the stage where it stands as one of the professions along with law and medicine, and if it is to hold this position, its members must be trained not only in skillful manipulation, but also educated to think on the problems of the field with which dentistry is concerned. Such a line of thinking is impossible without an understanding of the phenomena with which dentistry deals. By understanding we mean to imply a comprehension which is much wider and more intellectual than the mere memorizing of facts and statements.

What are the phenomena with which dentistry deals? What is the field of dentistry? In a broad way the service of dentistry is to remedy through corrective and restorative means, certain phases of pathological anatomy and pathological physiology in human beings.

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*One of a series of articles written for THE DENTAL SUMMARY by Dental College Teachers.

In order to affect a change from the abnormal to the normal function, the dentist must know and understand the normal and must discern the abnormal function. But function is so intimately correlated with structure that one's comprehension must include structure as well as function. Indeed the usual, and only logical approach to a knowledge of function is through a preliminary knowledge of structure.

Man, the biological form with which the dentist deals, is the most specialized and most highly organized of all animal or plant forms. The structure of man can be intelligently interpreted only through a knowledge of the structure of simpler forms of animals. It is true that one may memorize a vast body of statements, facts and names concerning man, just as one might memorize a page of the dictionary, but the meaning of these is quite obscure except in the light of fundamental biological phenomena.

Hence, if one is to comprehend human anatomy and human physiology he needs a background of comparative anatomy and comparative physiology. The anatomical unit is the cell, and the gross anatomy of such an organism as man is but a combination of cells variously modified in form and relations. As a corollary to anatomy being a summation of cellular structural units, we know that physiology is likewise the summation or resultant of the activities of these various kinds of cells. But these modified cells are extremely complex and an understanding of their structure and function is best approached through the study of simpler cells, such simpler cells as are found in lower animals and plants.

The study of lower animals and plants with their various structural conditions and functional phenomena, permits the student gradually to lay a foundation of knowledge of the fundamental biological phenomena, and with this background he is able to comprehend the specializations of these phenomena as seen in man.

To the student who begins the study of human anatomy without any previous training in biology and comparative anatomy, the subject seems a wilderness of detail. Such a student wanders and flounders about in his study of the subject for weeks, since he lacks the knowledge and consequent ability to pick his way successfully through the maze of detail to the underlying fundamentals. The result is that the subject becomes to such a student merely a nightmare of terminology without any seeming beginning, end, or significance.

On the other hand the student who has taken a comprehensive course in biology, including some comparative vertebrate anatomy, finds that human anatomy, both gross and microscopical is but a continuation of his earlier study and therefore from the outset he has a viewpoint which enables him to get a real grasp of the subject.

Normal anatomy—gross and microscopical, but especially microscopical—is the foundation upon which the student must build his insight into physiology. Upon these two must rest the knowledge and understanding of pathological anatomy and pathological physiology which are the two main factors of disease. Therefore, it seems evident that if a student is to secure any grasp of the subject of dentistry, aside from facility in mere manipulative skill, he must get his anatomy thoroughly, and experience has shown abundantly, that a preparation in biology is essential if one is really to comprehend anatomy.

A study of biology not only gives the student a body of knowledge which prepares him for the study of anatomy, histology, physiology, bacteriology and pathology, but it also introduces him to a method of study which is a leading factor in his securing a firm grasp of these subjects.

The method of study in language, history and mathematics is quite different from that in the natural sciences. In the natural sciences the most important part of the instruction is the laboratory work. Of the laboratory work the most momentous phase is the student's own observations and his interpretation of these observations. The recording of these observations is, to be sure, material, because it organizes the information in the student's mind, but recording is entirely secondary to observation.

In physics, chemistry and biology, the three sciences ordinarily studied in high school or in the early years of college, the observation is of very distinctly different types. In physics it consists largely in the accurate reading of instruments and in acquiring a comprehension of activities expressed in fixed physical units of dimensions. It is primarily quantitative observation. In elementary chemistry the observation is largely of conditions of consistency—solid, fluid, or gas—of color, and of reactions chiefly in terms of change from one condition to another. In biology observation is largely a qualitative one of form, of variations, of relations to other structures, and of motion repeated in slightly modified manner under changing conditions.

Those subjects which are fundamental to dentistry, namely, anatomy, histology, physiology, bacteriology and pathology are all biological in nature. In fact they are but circumscribed fields of biology. They must be studied and acquired by the biological method of study. If therefore, the dental student can acquire some experience in the biological method of study before he takes up those subjects that are so fundamental and so important to dentistry, he will be able to gain a far better comprehension of them than if he has to approach them by those non-biological methods with which he is familiar but which are not adapted to effective use in the study of these subjects.

Biology, as usually taught in beginning courses, is necessarily more largely morphological than physiological. It trains the student in observation of form in its varied relations. Nowhere else in the training preliminary to the dental subjects, except in technical drawing, does the student secure any drill in the perception and appreciation of form.

The dentist is very largely engaged in producing and reproducing form. The restoration of a tooth outline eroded by decay is unsuccessful unless the original form and contours are restored. A crown to be effective, both from the standpoint of function and appearance, must have the correct form. A partial denture is a failure unless artificial teeth of correct form are chosen. A full denture is a disfigurement unless in form it is in harmony with the anatomical structures with which it is associated. The purpose of orthodontia is largely a restoration of normal form of the dental arch and position of the teeth in the arch.

Therefore a study which trains a dental student in observation and appreciation of form seems especially desirable, and biology is preeminently a training in observation of form and form relations.

A knowledge of biology brings to the dental student a clear appreciation of the fact that the teeth of man are not aberrant accessions to the organism, but are the culmination of a series of similar structures running through all the groups of vertebrate animals and represented also in many invertebrates.

A knowledge of comparative dental anatomy is fragmentary unless it extends to an acquaintance with the entire anatomy of the animals bearing the teeth, and includes a knowledge of the place of these animals in the line of descent, as well as of their habits and the character of their food.

The study of biology also brings to the student's mind appreciation of the fact that the deposits of salts of calcium and other elements by living cells to form the teeth, is not an independent phenomenon found only in these structures, but rather that it is a continuous process found throughout the animal kingdom. The process of formation of enamel and dentin is directly comparable with the formation of the shells of foraminifera, those unicellular animals whose skeletons form a deep layer of ooze covering the bottom of a great part of the ocean. The process of tooth formation is likewise directly comparable to the formation of the skeletal spicules of sponges, the corals, the shells of molluscs and crustacea, the internal skeleton of all vertebrates, the scales of fishes and various structures in many other animal groups.

To the dental student who knows biology, his profession becomes a romance with intimate relations in a multitude of directions to the entire plant and animal realm. Dentistry, through biology, will thus acquire both breadth and depth and will tend to keep the members of the profession away from the intellectual narrowness nurtured by the merely mechanical act of operative procedures on one small part of the anatomy of a single animal.

There are probably very few practicing dentists who would deny that inorganic chemistry is not only a desirable but a necessary preliminary to dentistry. Inorganic chemistry deals primarily with the non-living world. The dentist in his profession deals chiefly with living tissues and so it seems fair to say that biology, the fundamental science of living things, has a claim on his attention prior to the claim of inorganic chemistry.

The dental course taken by the dentist now in practice did not contain a course in biology. Moreover, the majority of dentists had no more than a high school education when they entered upon the study of dentistry. Only rarely, in the past, has a dental student taken college work preliminary to his professional course. The courses in biology in the high schools up to within a decade have been courses in nature study rather than in biology from a scientific approach and method.

As a consequence very few dentists appreciate fully what is embraced by the subject of biology. To many it is synonomous with "bug-hunting" or plant-collecting. It therefore seems worth while to call to the attention of dentists some few of the important bearings and relations of biology.

It is probable that but a minority of dentists ever heard of chlorophyl. Yet chlorophyl is perhaps the most important material thing in the world. Chlorophyl is found in small protoplasmic masses containing a green pigment and known as chloroplastids. These chloroplastids are of microscopical size and occur in the leaves and stems of plants. They have the far-reaching property of being able, in the presence of sunlight, to synthesize the inorganic elements and compounds absorbed by the plant from earth, water or air—such as oxygen, hydrogen, carbon, nitrogen and their simple compounds—and by this elaboration to form organic bodies such as the starches. By further elaboration, the starches participate in the formation of the sugars, proteids and fats. Plants that have no chlorophyl (known as fungi), and animals, with the possible exception of a few of the lowest forms, lack this synthetic power. The food which animals require is almost entirely organic; they must have starches, proteids, fats and sugars. The only source of supply of these organic foods is from the chlorophyl-bearing plants. True, we eat fungi and other animals, but these fungi and these animals required organic food and so were ultimately dependent upon chlorophyl. It is evident therefore that not only man but all other animals are dependent on chlorophyl for food, and food is essential to existence.

But there is a bearing other than food. The trees which produce our lumber, our rubber, the plants which produce our cotton, the worms which produce our silk, the animals that produce our leather and wool, even the molluscs from which come many of our buttons are all the products of the activity of chlorophyl. Industry, transportation and commerce are almost entirely dependent on coal for fuel. But coal is only an aggregation of plants of the carboniferous age, and the carbon which constitutes the coal was nearly all absorbed from the air and fixed by the chlorophyl of the plants of that geological period.

I have cited the activity of chlorophyl as simply one of the fundamental biological phenomena with a wide general interest. There are many more and some apply especially to the more restricted field of dentistry.

Many problems of intimate human interest are problems of pure biology. The whole question of fermentation—which is due to the activity of non-chlorophyl bearing plants like the yeasts, the moulds and bacteria—is purely biological. Akin to this is the relation of bacteria to disease. Disease is caused not only by unicellular plants, the bacteria, but in some cases by unicellular animals. Sometimes the transference is direct, as in syphilis; again it is through an intermediate host such as the flea of rats for the organism of bubonic plague, the mosquito for yellow fever and malaria. Hence these diseases involve not only a knowledge of the organism that directly causes the disease in man but also the intermediate host, whether that be a mammal like the hog for tapeworm and trichina, or an insect for such diseases as typhus. All of these are biological problems and their solution and the understanding of them comes only through biology. Asepsis and antisepsis are biological problems for they are based upon an intimate knowledge of the conditions under which bacteria cannot survive. One might enumerate many more things that are concerned directly or indirectly with the science and art of dentistry that are based on biology.

Since biology is so fundamental to the existence of man, to industry, to health and disease in general, and to the field of dentistry in particular, it seems but logical that the dental student and the dentist of the future should be grounded in his conceptions by some instruction and study in biology as a science, before he gives his attention to the more restricted part of biology which lies within the field of dentistry.

The recent advances in dental education have the purpose to make the dentist of the future a better educated man than has been possible in the past. If the dentist is to keep abreast of his colleagues in other professions he must broaden the scope of his knowledge and interests. Dentistry has suffered from opprobrious epithets based upon the conception that dentistry was merely a trade or at best an art, that the dentist carried out certain mechanical manipulative procedures with little conception of the reason for them. With the broader scope of the dental course and with better educational requirements, not only in the dental school but also preliminary to the dental course, the profession will show that it is more than a mechanical trade. The basic foundation of such an improvement in dentistry seems to the writer to lie in giving the future dentist an underlying knowledge of biological phenomena.

It is hoped that the present members of the dental profession, who in greater part were denied the advantage of a course in biology, will, after a little thought, appreciate that the addition of biology to the dental curriculum of the present day prepares the student for the study of the more restricted field of biology represented by anatomy, physiology and pathology of man, both by giving a body of basic facts and by training in the biological method of study; that it also trains the student in appreciation of form; that it gives an understanding of the relation of tooth structure and function to structure and function of similar organs in other animals, and finally that it deepens and broadens the subject of dentistry by connecting it to many other fields of human knowledge; in a word, that it is a great factor in changing the dental profession to a broadly educated body of men who can no longer suffer the epithet of "skilled mechanics."

If the dentists in practice see the desirability to the dental student of some preliminary knowledge of biology, they can materially help dental education and advance the interests of the profession, if in advising dental students and prospective dental students they will support the claims of biology rather than decry its being required in the dental curriculum of the present time and as one of the required studies preliminary to entrance to the dental curriculum of the near future.

1353 E. 9th St.

This magazine wishes it known that it favors, with all its might, compulsory physical examination and education, as one practicable method of restoring sanity to a world gone mad with licentious and riotous living. Anything, in the name of common sense, that will check the present tendency toward disintegration and a return to barbaric selfishness, and reestablish at least some degree of disciplined life.—G.E.H.

American Institute of Dental Teachers

The next annual meeting of the American Institute of Dental Teachers will be held at the Claypool hotel, Indianapolis, Ind., January 24, 25 and 26, 1921.

The program will contain much of interest in dental teaching methods and dental educational affairs. A cordial invitation is extended to all ethical practitioners and others interested along these lines to attend the sessions.

DR. ARTHUR D. BLACK, *President.*
DR. ABRAM HOFFMAN, *Secretary.*
381 Linwood avenue, Buffalo, N. Y.

FUNDAMENTALS OF OPERATIVE DENTISTRY*

BY W. H. O. McGEHEE, M.D., D.D.S., CLEVELAND, OHIO

PROFESSOR OF OPERATIVE DENTISTRY, DENTAL PATHOLOGY AND THERAPEUTICS, AND SUPERINTENDENT OF CLINICS IN THE DENTAL SCHOOL OF WESTERN RESERVE UNIVERSITY.

THE CAST GOLD INLAY

AN INLAY may be defined as a material, usually gold or porcelain, which has been so constructed out of the mouth and later cemented in one piece into the prepared cavity of a tooth, that it will perform the required functions of a filling.

The modern cast gold dental inlay was devised by Dr. William H. Taggart, of Chicago, and introduced into dentistry in 1899. Before that time, however, other methods of constructing gold inlays were in more or less limited use in dentistry, but were largely unsuccessful, on account of the crudeness of the procedures followed and the poor results obtained.

One of the methods, which might be termed the "matrix method" may be briefly described as follows: Construct a matrix of the cavity in platinum or goldfoil, as for porcelain inlay work. While still in position in the cavity, partially fill the matrix with loosely packed crystal gold, remove and flow in a small amount of twenty-two karat solder. Replace in the mouth and reburnish to perfect the adaptation, after which remove, invest and completely fill the matrix with the twenty-two karat solder. Polish and set the inlay with cement.

Another procedure, known as Alexander's method, was as follows: Pack the cavity full, but loosely, with crystalline gold, remove and invest, leaving a large opening at the top of the investment. After heating, flow in twenty to twenty-two karat solder, which fills in the meshes of the gold and makes a solid inlay. Remove the investment, set with cement and polish.

Although the profession is greatly indebted to Dr. William H. Taggart for his work in greatly improving the methods of constructing the gold inlay, it must be said that these methods were not entirely original with him, but were a revival or adaptation of very old principles, used over long periods of time in mechanics and the arts. The "Cire Perdue" or disappearing model, or "wasting wax" process of casting was in common use in the founding art thousands of years ago. This is also true of the centrifugal and pressure methods of casting.

The historians, Herodotus and Diodorus, refer to the casting in bronze, by the disappearing wax model process, of statues that were set up in the Temple of Belus in Babylon, 2230 B. C. The golden calf of

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(*Continued from page 994, NOVEMBER SUMMARY).

Aaron, referred to in holy writ, and which was cast from the jewelry of the Hebrew worshippers, supposedly dates back to 1491 B. C. Numerous references of similar nature may be found in the literature of many nations, extending through the ages up to modern times, all of these demonstrating that our present methods are duplicates or modifications of very old procedures.

The *indications* for the gold inlay may be mentioned as follows, viz.:

First, for restoration of abraded surfaces, owing to its density.

Second, as a substitute for the shell crown in badly broken-down posterior teeth.

Third, as a time saver to operator and patient.

Fourth, in cavities where prolonged exclusion of moisture is impossible.

Fifth, in invalid, young, or old patients, unable to bear prolonged operations.

Sixth, in teeth with weakened peridental membranes.

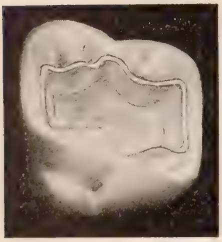


Fig. 178

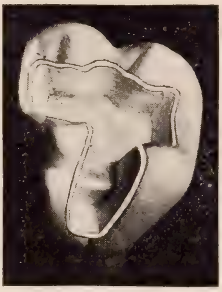


Fig. 179

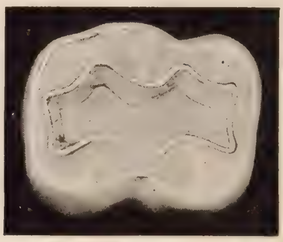


Fig. 180

Fig. 178—Cavity preparation for a gold inlay on the occlusal surface of an upper molar.
Fig. 179—Occlusal cavity on an upper molar, involving the lingual groove.
Fig. 180—Inlay preparation on occlusal surface of a lower first molar.

Seventh, as abutments for bridge work.

Gold inlays are, as a rule, *contraindicated* in small cavities, shallow cavities, and proximal cavities not involving the angle, unless these latter are large and the lingual wall is lost, thus allowing ready withdrawal of the wax model and insertion of the inlay from the lingual aspect. Since the introduction of the gold inlay and the synthetic filling, the use of cohesive gold as a filling material has rapidly diminished. However, there are still many conditions which justify its use, and the gold-building operation far exceeds all others in the college clinic for developing technical skill and manipulative ability.

414. How should *Access* for inlay work be obtained?

Principally by separation of the teeth; not by extensive cutting of tooth structure.

415. Should cavity preparations for gold inlays be performed with *Access of Moisture?*

All cavity preparations, for whatever material, should be made with the saliva excluded, to perfect the view of the cavity, to diminish sensitivity, and to maintain asepsis.

416. In what respect does *Cavity Preparation* for the gold inlay differ from that for other materials?

Very little, except in the method of retention and the character of the marginal bevel. Adequate *resistance form* should always be obtained. Walls should not be made absolutely parallel, but should diverge slightly, to allow for proper "draw." (*Figs. 178, 179, 180, 181, 182, 183, 184, 185 and 186*). *Retention* should be provided, wherever possible, by the use of the dovetail mortise form, either in the form of an occlusal (*Figs. 187, 188, 189, 190 and 191*), incisal or lingual dovetail step (*Figs. 192, 193, 194, 195, 196 and 197*), thus keeping the inlay in place. Additional

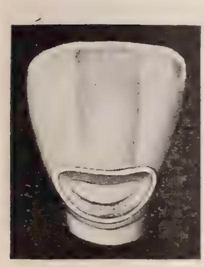


Fig. 181

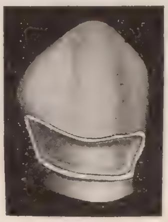


Fig. 182

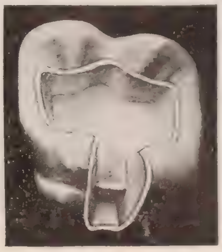


Fig. 183

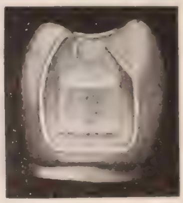


Fig. 184

Fig. 181—Labial cavity on an upper central incisor.
Fig. 182—Inlay preparation on a cuspid with more extensive caries involvement than that shown in Fig. 181.
Fig. 183—Step form on an upper molar involving the lingual groove.
Fig. 184—Proximo-occlusal cavity on a bicuspid.

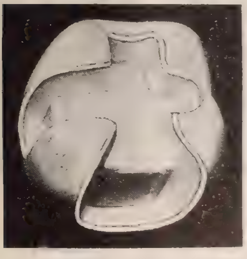


Fig. 185

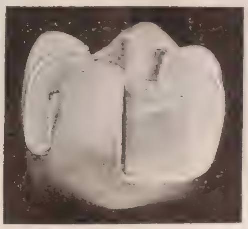


Fig. 186

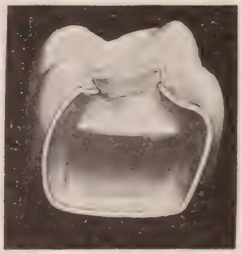


Fig. 187

Fig. 185—Double step cavity on a molar.
Fig. 186—Another view of the cavity seen in Fig. 185.
Fig. 187—Cavity on an upper molar, showing dovetailed occlusal step for locking the inlay into position.

retention may also be obtained by the use of twenty-gauge platino-iridium clasp metal pins on gingival, incisal or pulpal walls of vital teeth (*Figs. 198, 199, 200 and 201*), or of sixteen to fourteen-gauge pins of the same material, inserted into the canals of pulpless teeth (*Figs. 202, 203 and 204*); deepening of the point angles is also considered admissible, the cutting being done entirely at the expense of gingival or pulpal walls, with the result that the wax of the model may be forced into them and, being withdrawn, will form small spurs on the inlay, producing the same result as if pins had been used. (*Fig. 205*). Extra retention may also be accomplished, if desired, by temporarily filling in undercuts in the cavity with wax of a different color from that used in the model. Before setting the inlay, this is removed, affording space for increased body of cement. Some operators also advocate removal of wax from the under surface of the model before casting, thus affording an increased grip of the cement on

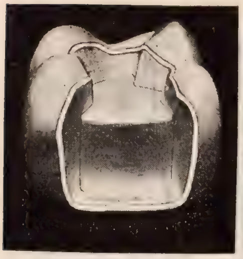


Fig. 188

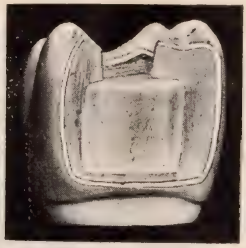


Fig. 189

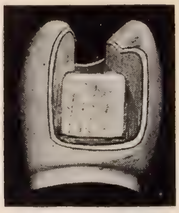


Fig. 190

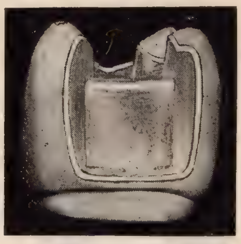


Fig. 191

Fig. 188—Inlay preparation involving central and distal fossæ and proximal surface on a molar. The inlay will be keyed into position by the dovetail occlusal step.
Fig. 189—Proximo occlusal cavity on a molar.
Fig. 190—Step form on a bicuspid.
Fig. 191—Another view of the cavity shown in Fig. 188.

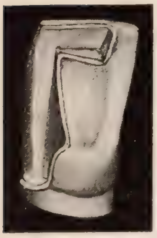


Fig. 192

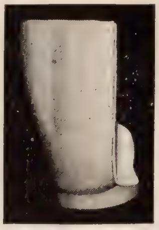
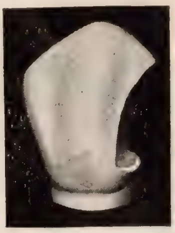


Fig. 193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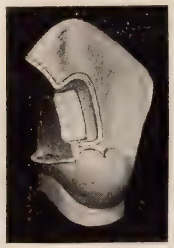
Fig. 195

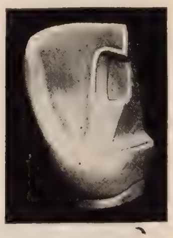
Fig. 196

Fig. 192—A step form involving the mesial, lingual and incisal surfaces of an abraded central incisor. The inlay is locked in place by the incisal step.
Fig. 193—Labial view of the cavity shown in Fig. 192.
Fig. 194—Cavity with a lingual "draw" on a cuspid.
Fig. 195—Lingual view of the cavity seen in Fig. 194. The lingual dovetail form.
Fig. 196—Lingual dovetail form on a central incisor.

the inlay after it is cast and set. Some also advise the undercutting of the walls of the cavity after casting the inlay and before setting, for the same purpose. The author does not advocate either of these latter procedures, as routine practice, since he believes that more ideal results are procured by obtaining a perfect fit of the inlay to the cavity walls. *The cavo-surface Angle* should be made obtuse and the bevel angle should not be deeply buried, thus resulting in a long, thin bevel and a feather edge to the metal. The bevel should in most cases extend one-fourth to one-third the thickness of the enamel and range from six to ten centigrades outward. Margins over which the wax model has to travel during withdrawal should be especially highly polished, to avoid roughness and marring of the wax. Before setting the inlay, the cavity should be given a bath, first

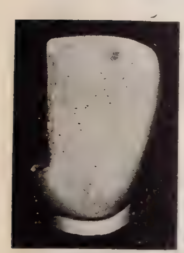
Fig. 197

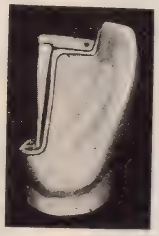
Fig. 198

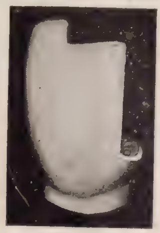
Fig. 199

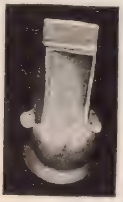
Fig. 200

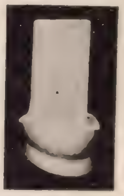
Fig. 201

Fig. 197—Labial view of the cavity shown in Fig. 196.
Fig. 198—Preparation for a pin inlay on an incisor. Lingual view.
Fig. 199—Labial view of the cavity seen in Fig. 193.
Fig. 200—A mesio-disto-incisal cavity on a lateral. Holes drilled for insertion of pins on the gingival walls.
Fig. 201—Labial view of the cavity seen in Fig. 194.

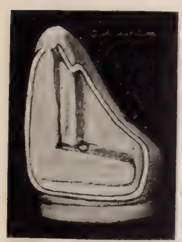
Fig. 202

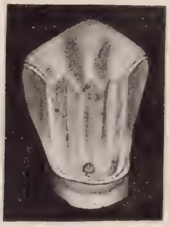
Fig. 203

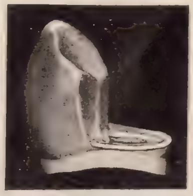
Fig. 204

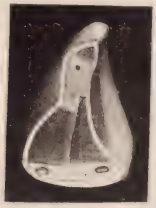
Fig. 205

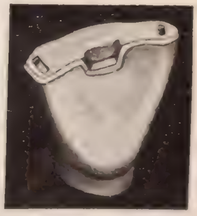
Fig. 206

Fig. 202—Cavity prepared for insertion of a pin inlay in a pulpless cuspid tooth.
Fig. 203—Extensive preparation for a pin inlay in a pulpless bicuspid. The lingual cusp is to be restored with gold.
Fig. 204—Another view of the cavity shown in Fig. 198.
Fig. 205—A proximo-incisal cavity on a central incisor. Point angles have been drilled in the gingival wall for producing spurs on the wax model and inlay for increased retention. A pin is to be used on the incisal step.
Fig. 206—Showing preparation for restoration of the incisal edge. Retention is provided for by the use of pins and a step on the lingual surface.

in chloroform to remove traces of wax and fatty matter, and then in alcohol. A study of the additional cavity preparations illustrated in *Figs. 206 to 216* will be helpful.

417. Describe the *Technic* of obtaining the *Wax Model.*

Heat the wax in water at a temperature of 138° Fahrenheit. Mold into a cone (working between the thumb and fingers until plastic), and force into the cavity until overfull and perfectly adapted to the walls. Use a lubricant in the cavity if necessary, such as olive oil or liquid paraffin, to facilitate easy withdrawal. Have the patient bite into the wax and chew on it, to obtain the

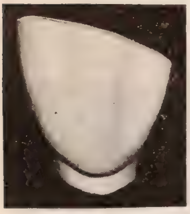
Fig. 207

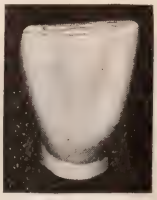
Fig. 208a

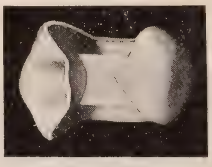
Fig. 210

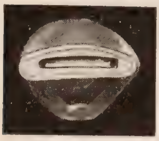
Fig. 208b

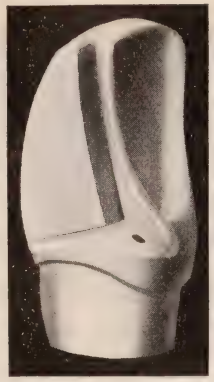
Fig. 209

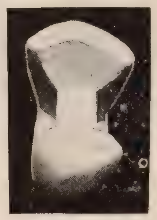
Fig. 211

Fig. 207—Labial view of preparation illustrated in Fig. 206.
Fig. 208a—Labial view of preparation illustrated in Fig. 207.
Fig. 208b—Restoration of the incisal surface on a lateral. The inlay is to be seated into a mortise, and retention is to be provided for through the use of pins.
Fig. 209—An excellent preparation for an inlay on the proximal surface of a central incisor involving the angle.
Fig. 210—An M. O. D. cavity on a bicuspid.
Fig. 211—M. O. D. cavity on a bicuspid. Much more extensive involvement of the cusps. The entire occlusal surface will be restored with gold.

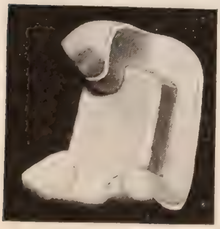
Fig. 212

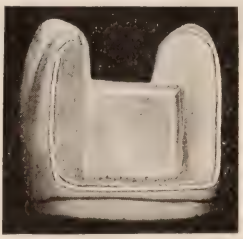
Fig. 213

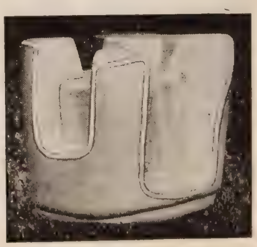
Fig. 214

Fig. 212—A badly broken down molar. It has been necessary to remove the disto-lingual cusp for reasons of strength.
Fig. 213—Same cavity shown in Fig. 212.
Fig. 214—A badly involved molar. The entire occlusal surface will be restored in gold. The points of the cusps have been removed for reasons of strength.

proper occlusal form. Then trim off excess from the occlusal surface, and carve to proper contour on approximal surfaces, with Taggart's, Roach's, or other inlay carvers (*Fig. 217*), until smooth, after which put on a higher finish with chloroform. Among the special waxes devised for this purpose may be mentioned Kerr's, Taggart's and Ransom & Randolph's Standard.

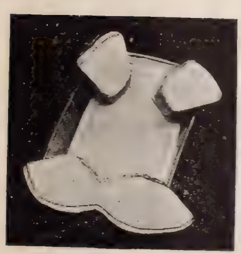

Fig. 215

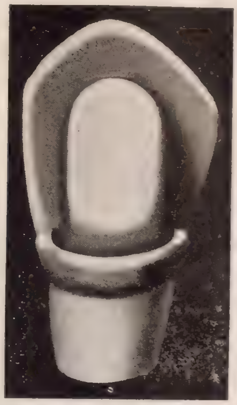

Fig. 216

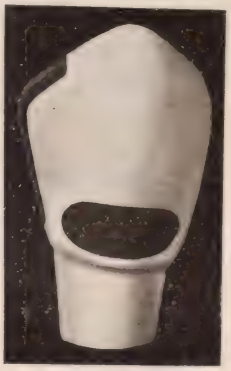

Fig. 218

Fig. 215—Same preparation illustrated in Fig. 214.
Fig. 216—Preparation for a Carmichael attachment.
Fig. 218—Wax model carved and ready for removal.

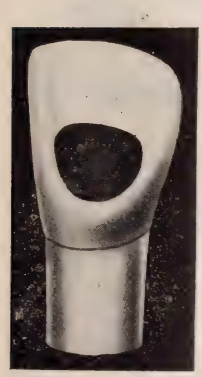

Fig. 219

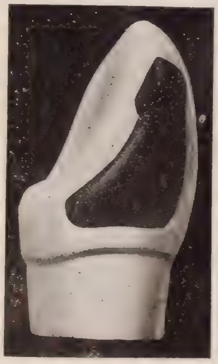

Fig. 220

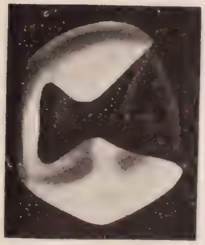

Fig. 221

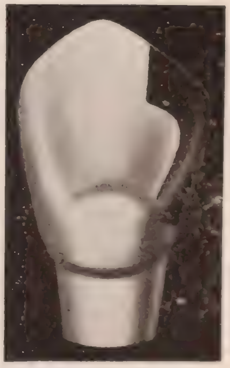

Fig. 222

Fig. 219—Wax model carved and ready for removal.
Fig. 220—Wax model ready for insertion of sprue wire.
Fig. 221—Wax model ready for withdrawal.
Fig. 222—Wax model ready for insertion of sprue wire.

After completion of the model, it should be chilled in cold water before removal. (*Figs. 218, 219, 220, 221 and 222*).

419. How may the obtaining of the *Wax Pattern* be facilitated in badly broken-down teeth?

By the use of a matrix band encircling the tooth, to hold the wax in position during adaptation.

420. How may *Imperfect Adaptation* of a wax model at the gingival margin be overcome?

By adapting softened paraffin over the defective margin, forcing the wax model again to place, and trimming away excess. In many instances, however, a new model had better be made.

421. Describe *Taggart's Method* of making a gold inlay.

After the wax model is carved, chill it, heat and attach the sprue wire in a part of the wax affording sufficient bulk and admitting proper "draw," and carefully remove from the cavity; or remove with an explorer and attach the sprue wire afterwards. The sprue used may be a banker's pin, phonograph needle, or copper wire. After washing in alcohol, place the model in the crucible former (*Fig. 223*), with the sprue wire protruding through the opening, and gently cover the wax, by means of a camel's hair brush, with a thin batter of investment material, such as Taggart's, Imperial, or other finely-ground investment. Apply the casting flask, round edge down, gently fill with investment, and allow to set for fifteen minutes. Now carefully remove the crucible former and sprue, and heat slowly at low temperature for from one to two hours to burn out the wax; then melt a button of twenty-four karat gold and force into the mold with the casting machine, after which, remove from the investment, pickle in fifty per cent. solution hydrofluoric acid, polish roughly, cement into the cavity, burnish the margins and finish in the mouth.

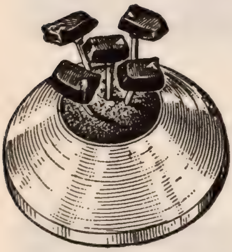

Fig. 223

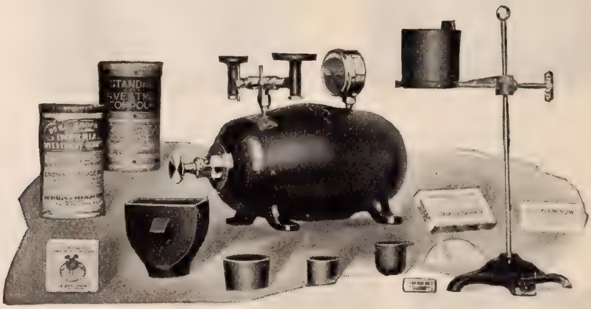

Fig. 224

Fig. 223—Five wax models in position in the crucible former and ready for investing
Fig. 224—The Elgin Vacuum Casting Machine and appliances.

422. What is the principal *Function of the Cement* in setting inlays?

It should be used only as a sealing agent for the joint between the inlay and cavity walls, and not for retention. If the cavity margins be properly beveled, and the inlay adequately burnished, the cement line is concealed and practically abolished.

423. What *Prevents Dissolution* of the cement joint around inlays?

It is supposedly due to the formation of a protective alkaline film of gelatinous mucus, which largely interferes with the entrance of and neutralizes acid saliva. The more perfectly fitting the inlay and the smaller the cement line, the less will be the tendency to dissolution.

424. Name some prominent forms of *Casting Machines.*

Taggart's, Jamison's, Price's, Elgin (*Fig. 224*), Campbell's Cow-Bell. These machines act on one or the other of the following principles, viz.: Centrifugal force, suction, or pressure.

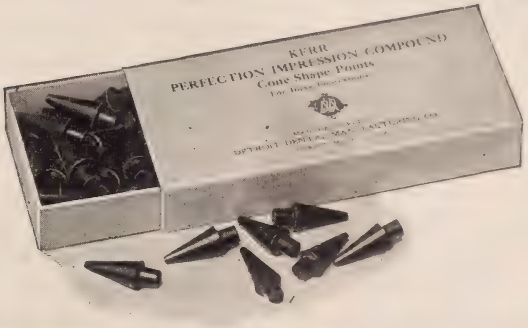

Fig. 225—Kerr Impression Compound cones for taking impressions of cavities for construction of inlays by the indirect method.

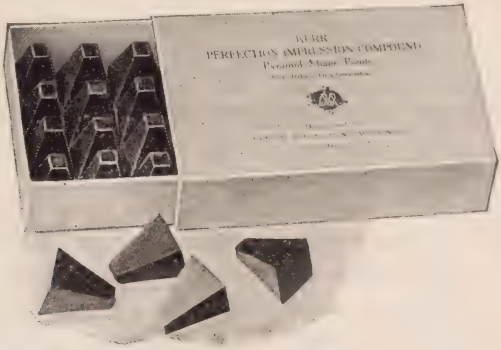

Fig. 226—Kerr Impression Compound pyramids.

425. Describe the *Indirect Method* of inlay making.

Take an impression of the cavity with Detroit Impression Compound (*Figs. 225 and 226*), imbed in plaster with the impression side up, obtain from this a model in amalgam, into which, after it has hardened, a wax pattern of the proposed inlay is adapted, after which the procedures are the same as in the direct method. If desired, a bite may also be obtained at the time the impression of the cavity is taken, and the case mounted on the articulator, in order that more exactness as to carving of the occlusal form of the wax model may be obtained. The principal advantage in the indirect method is the time saved at the chair.

In the construction of the gold inlay, most of the errors arising and misfits resulting are due to differences in the ratio of expansion and contraction of the wax model, the investment, and the gold at the different temperatures at which they are handled. The secret of success in this regard is to keep these materials at as nearly the same temperature as conditions will admit, throughout the process of construction. The wax should be allowed to assume room temperature before investing. The water used in mixing the investment should not be obtained direct from the water spigot, either hot or cold, but should be kept in a bottle at room temperature, ready for use. The investment should not be too hot at the time the gold is cast. There is no advantage whatever in a very hot investment, the disadvantages being change of form and tendency to destroy fine lines, as a result of the heat applied. Neither should the gold be heated to too high a temperature before casting, this also resulting in increased tendency to shrinkage on cooling. If these brief details are followed, much better results will be obtained in the fitting of inlays than otherwise.

MAY the coming year be one of discontent—the divine discontent that does not rest on the oars of past achievement, the discontent that strives for clearer vision, higher aspirations, better work.

May courage, cheerfulness, and calmness be yours. As your friend I shall be glad and proud of your success.

REPORT OF CLINICS, INDIANA STATE DENTAL SOCIETY

TECHNIC OF ROOT-CANAL PROCEDURE*

The members of Unit No. 2 of the Indianapolis Dental Society believe that a good method of sterilization is one of the main factors in good root-canal work. Such a method we give as follows:

Wash the field of operation with dioxygen, then spray the mouth with a good antiseptic mouth wash. On a pellet of cotton apply a ten per cent. solution of argyrol, to the gingival margins of gums of teeth to be clamped or ligated. This serves as a medicinal agent to the slight lacerations or injuries caused by ligatures or clamps.

Now we are ready to apply the rubber dam which is washed with alcohol before we apply it. Now that the rubber dam is in place, wash the teeth and a large area of the dam with tincture iodin. Follow with a wash of alcohol and dry.

Mechanically remove all decay possible from cavity with burs and necessary instruments but do not penetrate pulp chamber before another sterilization of cavity and surrounding areas. This can be done by bathing the cavity and a large area of the dam with tincture iodin. Wash and dry twice with alcohol.

We have secured growths of pathogenic bacteria in fields not properly sterilized, but none from fields sterilized by this method.

After the cavity and field have been thoroughly sterilized, then with round bur proceed to penetrate the roof of pulp chamber; care should be taken not to produce any pressure that would cause any of the contents of the canals to be forced through apex.

After you have opened pulp chamber, then cut away the roof of pulp chamber until you have good access to all canals. Special care should be taken in extending well towards mesial on lower molars to allow broach to take the possible distal curvature of the mesial root, and extending towards the distal in the crowns of upper molars to allow for the possible mesial inclination of divergence of the mesio-buccal root. Section 2.

REMOVING CONTENT OF PULP CANAL OR CANALS AND PREPARING FOR FILLINGS

First, see that floor of pulp chamber is all exposed and complete asepsis is maintained.

Second, insert small nerve canal explorer to apex of each root to determine length and direction.

Third, clean each canal with barbed broaches.

Fourth, enlarge each canal with reamers and files. Use smallest size first to apex and then larger reamers and files as you near the mouth of canal. Phenol-sulphonic acid may be used as an aid, following it always by a neutralizing agent.

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*By Members Unit No. 2, Study Club, Indianapolis Dental Society

Fifth, remove the loose tooth particles frequently by use of barbed broaches while enlarging canal, always being careful not to push contents through apex.

Sixth, remember, it is far more important to open canal to apex than to make a large canal part way down and leave an inacessible portion beyond. The use of small, strong, flexible broaches and reamers first, greatly aid in reaching the apex. If apical one-third of canal is large enough for smallest point of gutta percha your operation is ample.

Seventh, now make mouth of canal cone-shaped by use of Gates-Glidden or other drill and you are ready for your diagnostic wires.

The placing of small wires in the canals as far as the canals are accessible, and radiographing the tooth with these wires in position will be found to be a great aid in determining the length of the roots, size and direction of canals that have been made accessible.

Small copper canal points make very desirable diagnostic wires. A small loop on the large end of the wire, about one millimeter in diameter, will prevent it from passing so far into the canal that it would be difficult to remove.

FILLING CANALS

With the radiographic evidence satisfactory, observing all aspetic precautions as before, tooth is reopened, canals sterilized and desiccated with alcohol or acetone and root-canal drier, pulp chamber flooded with Callahan solution which is pumped into each canal with a smooth broach; a gutta-percha cone is inserted and pumped back and forth sixty strokes. Then a suitable portion from the tip of a fine cone is luted fast to the end of a root-canal plugger of suitable size and packed to the apex, following by small sections properly tamped into place by graduated pluggers until canal is full.

In a multirooted tooth but one canal should receive the Callahan solution at a time.

It is absolutely essential that the tooth be radiographed, after the canals are thought to be filled, to determine the success of the operation. Because of the angle at which it is necessary to radiograph most teeth it is advisable to have a very small encapsulation of the apical foramina to determine definitely that the canals are filled.

We agree that to tell when to use therapeutic procedure in periapical pathology to effect a cure in all cases is not possible or within the limit of the knowledge of mankind, yet we must, if we attempt this work, use something as a criterion.

First, good diagnositc radiographs.

Second, if possible a physical diagnosis chart compiled by the internist.

Third, bacteriological examination of the affected part and ascertain if the findings are correlated to the systemic disturbance, if any exists.

Fourth, the amount of bone destruction. The position of the destruction, the length of time since the death of the pulp, the physical conditions, the recuperative powers of the host, the importance of the tooth and the kind of infection—all must be considered carefully.

Fifth, after treatment, clinical symptoms and a radiographic check-up every six months should be carefully studied.

TREATMENT

Follow thoroughly your choice as outlined in recent current literature by the following men:

Dr. Hermann Prinz—Dichloramin-T.
Dr. J. P. Buckley—Formocresol and Pheno-Sulphonic.
Dr. Percy Howe—Ammoniated Silver Nitrate and Formalin.
Dr. U. G. Rickert—Ammoniated Silver Nitrate and Eugenol.
Dr. Weston A. Price—Findings.
Dr. Ernest Sturridge—Electrolytic Medication.

DRAIN TUBE FOR ANTRUM

BY J. F. ADAMS, CLINTON, INDIANA

Select a goose quill of, say, 5mm. in diameter, and cut to about 25 mm. long. Scrape clean and sterilize.

Bore holes with a No. 1, but about 4mm. from end projecting into mouth, on the palatal and buccal sides about 3mm. apart, through which to run orthodontia wire and with which a figure-8 ligature is tied to adjacent teeth. Perforate antral end with a No. 2 bur down about 5mm. making sieve appearance. Use a rubber cork.

Advantages: Animal in structure, tolerated by tissues, efficient, quickly made and easily cut off as healing progresses from within.

GOOD SUCTION AND CORRECT BITE

BY L. W. DAILEY, BLUFFTON, INDIANA

TO GET SUCTION ON UPPER DENTURE

Take impression with S. S. White's or Hall's Compound. Remove compound from tray and trim surplus. Scrape impression in roof, all hard parts, and over and just inside of tuberosities. Post-dam over tuberosities and across roof in rear of your tray with very soft wax, and take another impression while your wax post-dam is hot. Finish your impression with thin plaster, using potassium sulphate as setting medium. Make lower impression same as upper. Scraping your first impression lingually in tuberosity region before post-daming. Post-dam from tuberosities to tuberosities lingually. By so doing you get good under-cuts, and a plate that won't rub tissues.

TO GET CORRECT BITE

Take bite with paddle and wax first; place models in same and attach to articulator. Make wax trial plates on these. After trial plates are placed in mouth and fastened together the models are placed in same and reattached to articulator.

EDITORIAL

A VALUABLE CONTRIBUTION TO DENTISTRY.

We want to call attention to an important book that is now being published under the auspices of the American Institute of Dental Teachers and under the direction of Arthur D. Black, A.M., M.D., D.D.S., F.A.C.S. It is an Index of Dental Literature.

For seventy years or more the dental journals have chronicled the progress of dentistry in the thousands of contributions they have published.

Dentistry gradually has developed, marked progress having been made in the last decade.

The world-wide mouth hygiene movement, the advanced requirements for admission to our colleges, the lengthening of the course from three to four years, the recognition accorded dental service by our Government, the reorganization of our National and State Societies, the development of dental research and proved relationship of mouth infections to general health have all combined to elevate dentistry to a position long coveted.

Yet the great mass of information furnished by contributions to the profession is almost unfathomable in its present state.

We need greater aids to make it available and this is just what Dr. Black is giving us in the compilation of this exhaustive Index of Dental Literature.

The Index is in two parts:

Part I *is a classified subject index* of papers, discussions and clinics as published in dental journals in the United States, England, Canada, Australia and New Zealand. There are 40,000 articles classified under about two hundred headings so that one may easily find all the articles on any desired subject. For each article is given the number of pages, devoted to discussion, etc. The task of finding what has been written on any subject has been completed once and for all.

Part II *is an alphabetically arranged author's index*, giving a list of books, papers, discussions and clinics—a complete record of the contributions of each man towards the progress of the profession, as recorded in our journals.

This is not a publication for profit. The work has been done under the direction of Dr. Arthur D. Black, of Chicago without remuneration, and is being published under the auspices of the American Institute of Dental Teachers, composed of the faculty members of the dental colleges in the United States and Canada. The Schools have guaranteed a part of the cost, the remainder must come from private subscriptions. *All who desire copies must order in advance.*

This volume will cover the five years from 1911 to 1915 inclusive. It will contain over 500 pages. A second volume covering the period from 1916 to date, and others for the years prior to 1911 are in preparation.

The publication of this index will immediately enhance the value of all dental journals, which are being rapidly accumulated in medical, dental and public libraries throughout the land. Heretofore our journal literature has been almost useless soon after publication for lack of an index, it being impossible to find articles on particular subjects.

This is an undertaking which will be supported by those who are serious in their desire to see dentistry advance. Are you one of this group? If so, send in your order at once, to the Secretary-Treasurer, Dr. Abram Hoffman, 381 Linwood Ave., Buffalo, N. Y.

DELAYED PUBLICATION

There are times when it is impossible to give as early publication as we would like to certain contributions and papers intended for publication in THE DENTAL SUMMARY, and we ask our readers to please to be patient with us, for it is not always the fault of the editor. The printers, like time and tide, wait for no man, and copy for the next issue has to be ready and sent to them on a certain date each month. If copy from contributors is not received in time, the editor has to supply something else, and the delayed articles cannot appear until a subsequent number is issued. Men who read papers or deliver lectures before our society meetings, often want to make revision before the paper or report is published, and sometimes it is months before the matter comes into the hands of the editor, and occasionally it is never returned at all. Consequently, in such cases publication is delayed or cannot be made. Sometimes writers promise articles and for some reason fail to fulfill their promise, and the editor gets the blame for the non-appearance of the promised contributions. So we want to ask our readers not to be too hasty to criticise, for all matters of worth will be published as early as possible, and where there is long delay the cause is something aside from neglect of the editor.

THE SEASON'S GREETINGS

We desire to extend the season's greetings and all good wishes to our readers, and to thank all of those who have spoken kindly of the good things THE DENTAL SUMMARY has brought to them during the past year. We appreciate it all and assure our readers that we have put forth great effort to give them even a better magazine during the year to come.

May the New Year bring you happiness and contentment; and may your efforts be crowned with success, is the wish of ye editor.

SUGGESTIONS

Conducted by F. R. Chapman, M.S., D.D.S., Columbus, Ohio

(To Our Readers: Give others the benefit of your practical suggestions by sending a description of them to Dr. F. R. Chapman, Schultz Building, Columbus, Ohio.)

Accidental Tearing of Rubber Dam

It often happens, when using a bur on a tooth over which the rubber dam has been placed, that the bur gets caught in the dam and so tears a hole. Don't pull bur away, but tie dam just below head of bur with floss slik tightly, then cut bur and dam away.

—*Gordon C. Barkley, Commonwealth Dental Review.*

For Erosion

A paste of milk of magnesia and prepared chalk, applied around the necks of the teeth before retiring, will remain longer than any preparation yet tried. Spread on a piece of thin muslin and placed under the lip at night will be found efficient in very wet mouths.—*Oral Health.*

Crowning Short Roots

Additional anchorage may be obtained in crowning those short roots where the band is not sufficient retention, by casting the cusp and allowing the cast to extend down into the pulp chamber which has been squared to receive it.—*E. J. Perry, Dental Facts.*

Obtunding Sensitive Cavities

In case of a sensitive cavity the best results may be obtained by flooding the cavity with the liquid of Justi's insoluble cement and letting it remain about a minute. With the cavity still moist with the liquid the sensitive dentin may be removed with very little pain. After a layer is removed and the cavity becomes sensitive again make another application. By this means most cavities may be prepared practically painlessly.—*F. J. Patterson, Dental Facts.*

A Quick Method of Replacing a Missing Tooth

If a tooth in a prominent part of the mouth has to be extracted, or falls out through pyorrhea or through accident, and it is necessary to provide a quick substitute, take a diatoric tooth to suit the case and pass a piece of Angle's regulating wire through the hole and ligate to the adjoining teeth. If can be done in a few minutes and will last till the work is permanently finished.—*S. Braddock, Commonwealth Dental Review.*

To Prevent Adhesion of Plaster

To prevent the adhesion of the plaster investment to the vulcanite, which is especially tenacious when the flask has been left unopened a long time after vulcanization, work as follows: After removing the wax, if the plaster is very wet, dry it some, then bathe its surface with a thick coating of liquid silex for about five minutes, after which wash away the silex by a stream of water. The silex will wash away entirely from the teeth, but enough will remain soaked into the plaster to prevent its adhesion to the vulcanite. A similar use of silex applied to the cast (once known as "model") makes a fairly good substitute for tinfoil, but requires for its application the opening of the flask after its closure on the rubber. Unless I am mistaken, this method of using liquid silex originated with R. W. Tench, of New York.

—*Stewart J. Spence, Dental Digest.*

A Sectional Tray

Take an impression of the parts with modeling compound placed in an oiled metal tray in the usual way; chill and remove from the mouth. Remove the compound from the tray and enlarge its impression side, cutting out all undercuts, so that when the compound is returned to the mouth it will pass in and out very easily. Roughen the impression side well, so that when the plaster is applied it will adhere to it. Now on the side of the compound which was next to the tray, make a groove (from one end to the other) quite deep, then with a knife split it in two, three or four sections as the case may demand. Put the fragments together and fasten them with beeswax. We now have a tray in sections which are fastened with wax and ready for the plaster. Mix the plaster thin, apply to the tray, and place in the mouth. When hard, the wax fastening the sections is scraped off and a knife is placed in the grooves and the sections pried apart. The impression usually comes off in as many sections as there are in the tray.—*A. Kassab, Dental Cosmos.*

A Method to Restore a Defective Edge on a Gold Inlay

We often have to discard a gold inlay casting because one of the edges is defective. This can easily be remedied by the following method:

Clean the inlay by heating, and plunge it in acid; wash, and place in tooth cavity. Make sure it is well home, and observe where the edge is defective. Now take a large pellet of S. S. White's pure gold and press it over the edge to be restored, allowing it to lap over into the cavity. Place inlay in tooth, press well home, tapping gently; then burnish pellet over edge of tooth, and remove both, being careful not to misplace foil pellet from inlay. Place a small piece of solder on the inside fringe of the pure gold and attach both together by heating with blow pipe. Place inlay and attach pellet back in cavity and again burnish to place. Cement in and polish. If this is done carefully, a perfect edge is the result.—*Howard R. Greenwell, Commonwealth Dental Review.*

Coating for Silicate Fillings

Thin solutions of flexible collodion, sandarac, resin, banana oil (amyl acetate), or lacquer may be used successfully. Each may be thinned with ether. A very thin solution of celluloid in acetone may be used, too. Any one of these varnishes is good and any one may be used for cavity linings, as well. Cocoa butter or any similar product, whose melting point is not higher than body temperature, is also very good.—*H. E. Tompkins, Dental Items of Interest.*

DENTAL CARE IN HOSPITALS

THREE-FOURTHS OF PATIENTS NEED IT AND ONE-FOURTH WOULD BE GREATLY HELPED BY IT

The necessity for teaching nurses dental hygiene has been adequately demonstrated by the percentage of disease cases directly traceable to lack of dental prophylaxis. It is estimated that three-fourths of the patients in hospitals need dental attention, and that one-fourth would be greatly benefited by it, says The Modern Hospital.

The most effectual co-operation between the medical and dental professions insuring permanent employment of dental surgeons in hospitals is the first step toward this control, but the establishment of a dental department in the hospital and the training of nurses in dental hygiene are the logical safeguards for correct and efficient treatment.

Patients in hospitals give, as a rule, very little attention to their teeth, principally because sufficient emphasis is not laid on the subject by nurses and physicians. In the University of Minnesota Hospital, where nurses are trained to teach the care of mouths, and some even to do instrumentation to remove coarse calculus or tartar, patients are immediately provided with tooth brushes and instructed in the art of keeping the mouth clean. The brushes are hung at the head of the beds to serve as a conspicuous reminder. The nurse, sometimes by personal demonstration on her own mouth, can often induce such desire for dental cleanliness that a flow of pus can be checked and irritated gums soothed to a healthy condition in a short time after daily care is begun. Coarse deposits can be removed by nurses trained in instrumentation, and the mouth of the patient made ready for the more delicate instrumentation of the dentist.

Thus the nurse's part in this important work of preventing secondary infections through focal infection is more vital than that of any one man who is not constantly present to watch the daily dental toilet.

Training nurses to handle efficiently this part of their work is only making use for the patient's benefit of the knowledge we now possess.

NEW PUBLICATIONS

Hygiene, Dental and General. By Clair Elsmere Turner, Assistant Professor of Biology and Public Health in the Massachusetts Institute of Technology; Assistant Professor of Hygiene in the Tufts College Medical and Dental Schools. With Chapters on Dental Hygiene and Oral Prophylaxis by William Rice, Dean Tufts College Dental School. St. Louis; C. V. Mosby Company Pub., 1920. Price, net, $4.00.

The author says: "There has hitherto been no treatment of the subject of hygiene specially prepared to meet the needs of the dental profession. In writing this book for the dental student and practitioner, special attention has been given to those phases of the subject which relate to dental practice wherever they occur.

"In arranging the order of the text, those aspects of both dental and personal hygiene that are not related to infection are first considered. Then follows a discussion of development of the new science of disease prevention and its effect upon dental practice, personal hygiene, and the public health."

The dentist occupying the position he does today should be well versed in hygiene, not only dental but general. He should be able to intelligently discuss the different phases of hygiene and to advise patients or others.

The book before us, aside from a discussion of Oral Hygiene, treats the Hygiene of Nutrition, Hygiene of Action, Hygiene of the Central Nervous System, Hygiene of Reproduction, The New Science of Disease Prevention, The Essential Facts of Immunity, Oral Prophylaxis, Communicable Diseases, Public Health Administration, Food Control, Water Supply and Waste Disposal, School Hygiene, Industrial Hygiene, Ventilation, Heating and Lighting, Control of Communicable Diseases, Disinfection and Disinfectants.

Modern Dentistry. By Joseph Head, M.D., D.D.S., Dentist to the Jefferson Hospital, Philadelphia. Second Edition Revised. Octavo of 382 pages with 315 illustrations. Philadelphia and London. W. B. Saunders Company, Philadelphia, London, 1920. Cloth, $6.00 net.

In the preface to this edition the author states that: "Dentistry, owing to the teachings of Pasteur, has at last awakened to its great responsibility. Henceforth no appliance, however beautiful externally, will be tolerated unless it can be kept absolutely clean, and no repair of a tooth or root will be countenanced unless it conforms to the standards of scientific mouth hygiene. Fillings, crowns, and bridges are no longer to be considered mere objects of art for personal adornment or mechanical trituration of food, they must primarily be hygienic."

In treating this subject Dr. Head has tried continually to keep these things in mind.

The book opens with a consideration of the subject of Causes and Effects of Mouth Infection, and the Prevention of Mouth Infection, and the Treatment of Mouth Infection. The author then takes up the subjects of Treatment of Root Canals, Fillings, Children's Teeth, Crowns, Replacing of Lost Teeth, Experiments Concerning Strength, Solubility, and Adhesiveness of Various Cements, Study of Roots and Gums by Means of X-ray, etc. Each subject has been treated in the light of advanced science in dentistry and Dr. Head has incorporated his own valuable discoveries with the methods accepted today as the best.

A Practical Treatise on Crown, Bridge, and Porcelain Work. By George Evans, D.D.S., F.A.A.D.S., formerly Clinical Professor of Dental and Oral Surgery, New York, Lecturer Baltimore College of Dental Surgery, etc. Eighth Edition, Revised and Enlarged. Philadelphia; P. Blakiston's Son & Co., Pub., 1012 Walnut St., 1920.

On account of changes and modifications in methods of practice made necessary by the evolution of the art of crown, bridge and porcelain work, it has necessitated almost entire rewriting of this work. But as in former editions, the text is prepared to meet the needs of college and post-graduate courses and of the practitioner as well.

The author's aim has been to give the dental profession an up-to-date compilation of methods of practice.

The text is comprehensive, concisely written and illustrated profusely. It is divided into seven sections: Part I, Materials and Processes used in Crown- and Bridge-work; Part II, Preparatory Treatment of Teeth and Roots for Crown- and Bridge-work. Part III, Artificial Crown-work; Part IV, Bridge-work; Part V, Removable Bridge-work; Part VI, Porcelain Dental Art; Part VII, Crown- Bridge- and Porcelain-work Combined with Operative Dentistry in Dental Prosthesis.

The author has endeavored to impress the reader with the importance from a physiological standpoint of the use of methods that permit the attainment of the desired results without devitalization of pulps, and thus avoid the chance of subsequent focal infection, and with the least mutilation of teeth, and the least exposure of metal. The subject of fixed and removable bridge-work is impartially discussed and merits and disadvantages of each clearly presented.

Porcelain Dental Restorations, with a Chapter on Gold Inlays. By William A. Capon, D.D.S., Assistant Professor of Dental Ceramics, Uni. of Penn., Fellow American Academy of Dental Surgery. Philadelphia and New York; Lea & Febiger, Pub., 1920. Price, net, $3.25.

The author says that his many years of experience in the application of porcelain in dental restorations has not in the least decreased his enthusiasm for the work, or his faith in its inherent value as the one filling material which most nearly meets the highest esthetic demands of a high-class dental clientele. This belief, and the hope that he might to some extent stimulate more interest in the use of porcelain for dental restorations have been the principal factors in inducing him to accede to the many requests for such a book at a time when the work involved infringed heavily upon the demands of a much crowded practice.

The book of 223 pages covers the subjects of: Porcelain, High-fusing Porcelain Inlays, Porcelain Crowns, Porcelain Jacket Crowns, Porcelain Bridges, Colors in Oil, and Their Practical Use in Porcelain Work, Low-fusing Porcelain Inlays and Gold Inlays. The text is illustrated with 294 engravings.

A Practicable Root-Canal Technic. By Arthur Barton Crane, D.D.S., Washington, D.C Philadelphia and New York; Lea & Febiger, Pub., 1920. Price, net, $2.25.

The author states that: "The object of this little work is to present in an orderly manner a complete root-canal technic which is giving a large percentage of successful results in the writer's practice. The facts and theories set forth comprise a digest of various methods advocated by the authorities, modified and supplemented by considerable study and some original research. Much of the matter included has already been made public in papers and clinics but it is hoped that by gathering together in a consecutive manner the procedures which have been most helpful to me, it may be possible for others by comparison, to clarify their own technic."

The subject has been treated in the following order: Diagnosis, Asepsis, Instrumentation of the Canal, Therapy, Bacteriology, Obliteration of the Canal, and Surgery.

Fifty-eight engravings illustrate the text.

Dental Materia Medica and Therapeutics and Prescription Writing. By Eli H. Long, M.D., Prof. of Dental Materia Medica and Therapeutics in the Dental Dept. Uni. of Buffalo, etc. Philadelphia and New York; Lea & Febiger, Pub., 1920. Price, net, $5.50.

This is the fourth edition of this well-known text-book, and it has been revised to date. The chapters on Analgesia and Anesthesia have been largely rewritten, also the article on Syphilis, and a new chapter on Animal Drugs has been added.

Doses have been generally included in the text, the average U. S. P. dose being employed for official substances, while the range of permissible dosage for all internal drugs is given in the index of drugs. The book containing 325 pages is concisely written and many diagrams and tables are used to elucidate the text.

A Text-Book of Dental Pathology and Therapeutics for Students and Practitioners. Based upon the original of Henry H. Burchard, M.D., D.D.S., rewritten by Otto E. Inglis, D.D.S., Professor of Dental Pathology and Therapeutics in the Philadelphia Dental College. Philadelphia and New York; Lea & Febiger, Pub., 1920. Price, net, $7.00.

This is the sixth edition of this much used text-book and it has undergone a thorough revision. New chapters on Prophylaxis, Radiography, Plantations, The Use of Electricity in Therapeutics, and Root Amputations have been inserted and many new illustrations added. In revising, however, the writer has maintained the original idea of a text-book, furnishing a description of each dental disease and its treatment in such manner that teachers may find it a useful adjunct in the presentation of the subject of dental pathology and therapeutics to their students.

Sec. I, deals with General Pathology; Sec. II, Aberrations in Eruption of Teeth; Sec. III, Developmental Abnormalities; Sec. IV, Acquired Non-Septic Affections of the Enamel and Dentin; Sec. V, Dental Caries and Hypersensitive Dentin; Sec. VI, Diseases of the Dental Pulp; Sec. VII, Diseases of the Pericementum; Sec. VIII, Pericemental Diseases Beginning at the Gum Margin.

The American Text-Book of Operative Dentistry. In contributions by eminent authorities. Edited by Marcus L. Ward, D.D.Sc., Professor of Dental Metallurgy and Crown and Bridge-work, and Dean of the College of Dental Surgery, University of Michigan. Philadelphia and New York; Lea & Febiger, Pub., 1920. Price, net, $10.00.

This is the fifth edition of this work, previous editions having been edited by Dr. E. C. Kirk. So much has been eliminated from the fourth edition, which was issued in 1911, that this present edition is virtually a new book. But this radical change has been rendered necessary by the rapid evolution which has taken place throughout the entire domain of the science and art of dentistry since the publication of the previous edition.

In the preface the editor says: "The constantly growing demand for preventive dentistry has made it necessary to treat several subjects in a much more extensive manner than has been done in former editions in order that the undergraduate student may more intelligently comprehend preventive dentistry in its relation to all other operative procedures.

"It is fully recognized that the scientific basis of many of the subjects which constitute preventive dentistry in its broadest sense is much more fully elaborated in the present work than would be justifiable in a treatise or text-book devoted exclusively to operative dentistry as an art; but as there appears to be a demand upon the part of students and practitioners for a volume furnishing a comprehensive view of the fundamental principles upon which alone an intelligent and rational practice may be based, the treatment of the subject of operative dentistry in the present work has been extended to include those principles."

A chapter on Roentgen Diagnosis in Dentistry, comprising about 100 pages of text, has been added to this edition. In the chapters on Local Anesthetic and Extraction of Teeth, substitutes for cocain, which are less toxic and equally effective in the removal of pain, have been given special attention.

The long treatise on orthodontia has been eliminated. The editor says: "Orthodontia has become a specialty with a scope so broad that it has seemed wise to include in this work only the principles of orthodontia that a general practitioner should know in order to enable him intelligently to advise those who are in his care."

The contributors to this volume are men of high standing in the dental profession:

The Anatomy of the Teeth of Man, is written by Dr. A. Hopewell-Smith; Dental Histology with Reference to Operative Dentistry, by Dr. Frederick B. Noyes; Preventive Dentistry, by Dr. Russell W. Bunting; Instrumentation, Cavity Preparation and the Filling of Teeth, by Dr. John V. Conzette, and Dr. R. H. Volland; Gold Inlays as Bridge Attachments, by Dr. Marcus L. Ward; High-fusing Porcelain Inlays, by Dr. W. A. Capon; Properties of Filling Materials, by Dr. Marcus L. Ward; Therapeutic Procedures in the Treatment of Infected Root Canals, by Dr. Hermann Prinz; The Preparation and Flling of Root-Canals, by Dr. Edgar D. Coolidge; Pathology and Treatment of Hypersensitive Dentin, by Dr. Hermann Prinz; Discolored Teeth and their Treatment, by Dr. Hermann Prinz; Local Anesthesia, by Dr. Hermann Prinz; Pyorrhea Alveolaris, by Dr. Russell W. Bunting; Extraction of Teeth and other Surgical Procedures, by Dr. Chalmers J. Lyons; Principles of Orthodontia for the General Practitioner, by Dr. Frederick B. Noyes; Roentgen Diagnosis in Dentistry, by Dr. Kurt H. Thoma.

In the quality and arrangement of text and illustrations, Dr. Ward and his collaborators have, in this edition, given the profession the best volume that has yet been published.

A Manual of Dental Prosthetics. By George Henry Wilson, D.D.S., Professor Emeritus of Prosthesis and Metallurgy, Dental Department Western Reserve University, Cleveland, Ohio; Special Professor of Prothesis in the Dental Department, University of Southern California, Los Angeles, Calif. Philadelphia and New York; Lea & Febiger, Pub., 1920. Price, net, $5.50.

This is the fourth edition of this excellent treatise on Dental Prosthesis. This edition has been thoroughly revised and its teachings are strictly up-to-date.

The author says: "A New School of Dental Prothesis is rapidly developing, and in this edition he has given the present status of the new School, while in no way curtailing the generally-accepted teaching of the Bonwill School.

"Chapter I has been extended to give the physics of the muscles and ligaments of mastication, thus laying a broad foundation for the New School.

"Dr. Hall's theories have been revised by him. Casting methods have been much enlarged and presented in a logical, up-to-date, but conservative manner.

"Roofless dentures are treated in a trenchant but practical way.

"The investigations of Dr. Geo. B. Snow on shrinkage in vulcanization are given in this edition.

"The motive of this book is: *much in a few words.*

"The purpose is to give the technic clearly once and to elaborate the underlying principle as much as may seem necessary. Therefore if a portion of the book seems to be devoid of technical descriptions it is because the text being read is an elaboration of a principle, a suitable technic for which will be found previously stated, but in sequential order. The book is designed for both the busy student and practitioner; therefore, in addition to the standard instruction in methods and materials the recent methods and materials are presented and discussed, but without prolixity."

Instruction in everything worth while in this important branch of dentistry is given in a manner easily understood, and 451 engravings are used to elucidate the text.

It is one of the real worth-while books, and every progressive dentist should secure a copy and follow its teachings.

SOCIETY·ANNOUNCEMENTS

The Dental Protective Association

The annual meeting of the Dental Protective Association of the United States will be held in the Palmer House, State and Monroe streets, Chicago, on the third Monday, December the 20th, 1920, at 4:00 P.M. sharp.

The report of the officers will be given; a board of directors will be elected, and such other business transactions as should come before the association.

All members are urgently requested to be present.

By order of the board of directors,
J. G. REID, *President*,
E. W. ELLIOT, *Vice-President and Secy.*,
D. M. GALLIE, *Treasurer*.

Wisconsin State Board

The Wisconsin State Board of Dental Examiners will conduct a licensing examination at the Marquette Dental College in Milwaukee, beginning Saturday, December 18, and continuing to Friday, December 24, 1920.

The Wisconsin dental law provides that "No person shall be examined by the board for a license to practice dentistry in this state, who shall not file with the secretary of the board, credentials proving to the satisfaction of the board, that he has a general education equivalent to that required for graduation from a high school or academy in the State of Wisconsin, having a four-year course beyond that of the eighth grade of the elementary school, and who is not a regular graduate of a reputable dental college or dental department of a university."

The educational credential showing graduation from a high school should indicate the subjects taken in the high school, the number of weeks devoted to each, the number of recitations per week, and the units of credit. The credential should be signed by the principal of the high school or academy or the city superintendent of schools.

A statement signed by the registrar showing graduation from a reputable dental college is preferred to the actual dental diploma.

All credentials should be in the hands of the Secretary of the Board not later than December 11, 1920.

WILLIAM KETTLER, *Secretary*,
State Board of Dental Examiners.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

More Sense Than Poetry

My friend, have you heard of the town of Yawn
On the banks of the river Slow,
Where blooms the Waitawhile flower fair,
Where the Sometimeorother scents the air
And the soft Goeasys grow?

It lies in the valley of Whatstheuse,
In the province of Letherslide;
That tired feeling is native there—
It's the home of the listless Idontcare,
Where the Putitoffs abide.

The Putitoffs never make up their minds,
Intending to do it to-morrow;
And so they delay from day to day
Till business dwindles and profits decay
And their days are full of sorrow.

Things begin to look as though the Pullemalls and the Savemalls would come to a clinch during '21, and fight it out to a finish. Some good stuff is coming to THE SUMMARY reader during the year, and nobody can afford to miss a single number.

The meeting of the Toledo Dental Society, out at the Sylvania Golf Club, November 12, was notable in more ways than for its perfect coal-broiled steaks, the product of Chefs Welker and Hartshorn, which, with baked potatoes and Hubbard squash—Oh, Boy!—followed by the most perfect specimens of cocoanut-cream and apple pies that ever have passed the censorship of my palate, made up the tremendously popular dinner at or about 6:30 P.M. In the first place, Dr. Lester Furnas came over from his new job at Western Reserve University for the purpose of passing on his latest modifications of all that is best in impression-taking and plate-making, which task he performed in his usual more than acceptable manner, in spite of the fact that the lantern wouldn't work because of defect in the wiring of the Club House so far as lantern-work is concerned, forcing Dr. F. to resort to his every-ready left hand that always works splendidly with black-board and crayon. In the second place, it was a rare treat to most of us to sit by a roaring log fire, on a cold night, reminding many of us of childhood's happy evening hours, when the side next to the fire scorched away merrily, even though the side next to the cold, cold world would have done good duty as a refrigerating unit. In the third place, it was refreshing to hear Dr. Travis admit that he, as well as many others in this particular locality, had difficulty in pronouncing "root" and "roof," which must have the double "o" sounded long and deep, not short and shallow, after the New England fashion.

Taken all in all, the occasion surely was a memorable one, and we all owe our thanks to the committee which had the matter in charge.

The Ransom & Randolph Co. is now printing the Monthly Bulletin, issued by the First District Dental Society of Detroit. Sample copies will be sent to Secretaries and others interested. It is a kind of publicity that we can recommend to other societies, and hope that others will take it up.

No dentist who cares to keep within hailing distance of the front trenches can afford to miss the January number of THE DENTAL SUMMARY. In addition to the usual run of good stuff, it will contain the final installment of Dr. Dayton Dunbar Campbell's splendid series, this one illustrated with two pages of four-color half-tones, in fitting manner bringing the series to a close.

If your subscription expires with this number, get your renewal in at once, either direct or through your dealer. Under conditions prevailing in the publishing business, it will be positively necessary to cut off all subscriptions that are not renewed, much as we should like to do otherwise.

Do not miss a single number, particularly do not miss the January issue.

A pair of theater tickets led to the murder of Dr. Ruth Rubin, and the suicide of her slayer, Dr. Max Rowe, at New York, October 22. Miss Rubin had bought two tickets intending to take her sister to see a play. Rowe, a would-be suitor who was not acceptable to Miss Rubin, learned of it and insisted upon knowing who was to be her companion. Being certainly no business of his, Miss Rubin refused the information, and also refused his offer of marriage. Infuriated, he shot her to death; then turned the weapon upon himself, with fatal results. So much for an education that developes intellect without a corresponding development of the ethical sense.

Dentists can do a mighty big piece of good work if they will step outside of their profession long enough to agitate the investigation of the so-called Juvenile Reformatories in their several states, which, in the great majority of cases, are really schools of degeneracy of the most disgusting type, of which crime of every type is but one manifestation. Such investigation should be conducted privately, by no means through any form of officialdom. Work it up; get possession of facts and proofs; be sure that your bomb is loaded before you explode it. Bear in mind always that it is the System that is to blame rather than individuals. I have some information that I shall be glad to pass on to Ohio dentists.

The New Rochelle offices of The Dentist's Supply Co. have been closed, and the business transferred to the Philadelphia office.

Jefferson county, Ky., dentists are raising a fund of $5,000 with which to build an amphitheater in the Louisville College of Dentistry, in honor of the late Dr. Edward M. Kettig, for many years a member of the faculty.

Dr. A. R. Ross, LaFayette, Ind., president of the State Association, is meeting with universal success in his effort to put over a movement to have a state-wide survey of children's teeth and mouths. The ultimate purpose of the survey is the establishment of free clinics in each county. Dr. Ross is just the man to inaugurate such a movement.

Troy, Mont., needs a dentist.

An up-to-date dentist can find a most excellent opening by addressing Addison Commercial Club, Addison, Mich. Territory over thirty miles square is without dental service.

They are having lovely times over in Germany. A strike of city employees has been met by a counter-strike of dentists and M. D's., who refused service to strikers. And so the merry whirl in the eddy of war goes on.

Two pseudo doctors, Sorgen and Simons, are in trouble in New York over the alleged fact that they have been conducting a fake preparatory school, a few weeks' study in which was guaranteed to do away with the pre-medical education of prospective dental students, and secure admittance into any reputable college. It is alleged that about one hundred short-cutters have taken advantage of the offers of the said doctors, and are now "paying the piper," besides being just $360 each to the bad, that amount being the fee charged for the alleged service.

The dental car idea is growing in popularity in the eastern states. It might be well for some of our middle states to look into it.

The dental meetings during the year 1920 probably will go down to history as the largest in point of attendance of any ever held, at least to date. To be sure, dentists are more prosperous than ever; they all have the money; but it does seem that some cause deeper than this is taking them to the meetings, particularly as the interest shown in the proceedings apparently keeps pace with the increased attendance.

The Dental Manufacturers' Club is giving a series of exhibits throughout the southern states. Those in attendance report crowded sessions and keen interest on the part of the dentists.

Licenseless dentists are having a hard time in Detroit these days. Four of them were arrested October 24, and others are slated. Direct evidence is obtained by sending instructed patients to the offices suspected. Good work. There are enough, well, "careless" dentists licensed to "practice" on a long-suffering public, without the added affliction of those who could not pass an examination as poundkeeper.

Dr. Percy R. Howe's diet theory of caries should be carefully looked into before it is discarded. It is my personal opinion that all diseases, including caries, of course, have their origin in faulty diet; further, I consider it proven that all diseases, other than surgical, can be "cured" by correct diet. And this opinion rests upon scientific experimentation, not upon mere theory.

There is one element in nature that man has by no means mastered — electricity; and it well behooves every one of us to handle that unbridled monster with great care and consideration. The other day that fact was overlooked by Dr. Frank G. Horton, Clyde, N. Y., who inadvertently or carelessly attempted to turn on the water while his disengaged hand was resting upon his motor. Instantly, he was siezed and held, while the current ran amuck through his body. The deadly grip was broken only by tearing loose the faucet and its connections. Another minute or two would likely have ended the doctor's earthly career.

While it is a subject of congratulation that the Tri-State Association recently organized at Memphis, Tenn., should start its existence with 500 members, local papers down there should control their enthusiasm. The claim that such a membership is greater than that of any other association of dentists except the National is wide of the truth. The Ohio State, with nearly 1500 members, Indiana with about 1,000, Illinois and New York with far more than either of those mentioned, should be taken into consideration before making such claims. We wish the new society all sorts of success; there is ample room for it; but it still has far to go before it can make good as the "biggest ever."

Dr. Burton Lee Thorpe, well-known dentist, of St. Louis, Mo., has recently moved to Pasadena, California. We hope the salubrious climate of California will bring back to him his old-time health and vigor.

Nebraska—Southeastern

Beatrice, Nebraska, October 29.—The Southeastern Nebraska Dental Association, in session here for the past two days, closed Thursday afternoon when the visitors were entertained at luncheon by the Rotary Club. Officers for the coming year were chosen as follows: President, E. A. Litchfield, of Humboldt; vice-president, C. T. Hatfield, of Fairbury; secretary-treasurer, J. Kirschner, of Humboldt. A program consisting of papers and discussions, including clinics, was carried out Thursday.

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and the *Only* Procain Anesthetic Containing
Suprarenin Synthetic Hydrochlorid

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Procain (American-made Novocain), is the basic Anesthetic Agent, combined with Suprarenin Synthetic, Duatol (guiacol carbonate), Thymol and Boracic Acid, in an Isotonic and Stable Solution, unaffected by age or climate.

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Per ounce, liquid	$1.00
Six ounces	4.80
Twelve ounces	8.40
Fifty ounces	32.50
Ampules, per dozen	1.00
Tablets "E", per vial of 50	1.25
Tablets "T", per vial of 50	1.25
Six vials, "E" or "T"	6.00
12 Vials "E" or "T"	11.50

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A Good Work

St. Louis, Mo.—For the first time in more than a century of endeavor, St. Louis University, which established the first school of Dentistry west of the Mississippi River and which operates the only school of Class "A" rating in Missouri, has made a public appeal for funds, to be used largely for the expansion and support of its Dental and Medical Departments. The University has asked its alumni and friends to raise the sum of $3,000,000, the income from one-half of which is to be used to pay the teaching staff of the Dental and Medical Colleges. New buildings and clinics for the dental and medical branches will cost $550,000 and the balance will be used for extension work of the Institute of Law, School of Commerce and Finance and College of Arts and Sciences.

The money asked for will be known as the Centennial Endowment Fund, although the 100th anniversary of the institution occurred during the war, when more than 3000 of the faculty, alumni and undergraduates were under arms, the College of Dentistry, in the three classifications, being represented by 374 men.

As an outgrowth of this activity and because of a recent ruling of the War Department, that in future all vacancies in the Dental Corps of the United States Army will be filled by graduates of Dental Colleges having a Reserve Officers Training Corps, such a unit now has been organized at the St. Louis University Dental School, with Major Robert W. Kerr, Medical Corps, U. S. Army, detailed by the Government as the Professor of Military Science and Tactics. Under the law there will be but ten such Dental College units of the R. O. T. C. in the entire United States.

As the purpose of the Endowment Fund is largely to keep the dental school up to the high standard which caused it to be selected by the government as one of these ten honor schools, the university asks the graduates of the college of dentistry, now scattered all over the earth, to constitute themselves committees of one to assist in the realization of the fund.

Ohio—W. D. Miller

Newark, October 15.—At the semi-annual meeting of the W. D. Miller Dental Association, held Thursday afternoon in the Masonic Temple, the following officers were elected: H. C. Barrick, president; Carl Sellers, of Danville, vice-president; H. L. McFadedn, recording secretary; E. V. Prior, corresponding secretary; W. B. Grossman, of Mt. Vernon, treasurer and J. W. Rohrer, of Granville, director of state society.

The next meeting will be held in Mt. Vernon, the second Thursday in May.

King George has a scuttle made from a big German shell.

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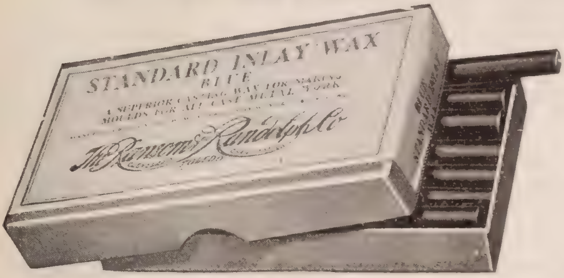

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All colors of **Standard Inlay Wax** are tough and rigid when cold, softening readily in flame or hot water. Do not flake nor scale when heated, nor readily chip or break when cold Plastic and tough when hot; can be spread and built up as needed. Cut easily, leaving a smooth, glossy surface. Carve readily and smoothly to sharpest lines. All colors burn out clean, forming very volatile gases that disappear without residue under moderate heat.

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Michigan—Fifth District

Grand Rapids, Mich., October 30.—The Fifth District Dental Society at its session in the Morton house Saturday elected: President, G. H. Tellman, Muskegon; vice-president, J. O. Scott, Holland, and secretary-treasurer, W. W. Gibson, Grand Rapids.

It was decided to hold the meeting next October in Kalamazoo.

The society voted to increase the annual dues from eight dollars to ten dollars, effective the coming year and empowered the new president to appoint a publicity committee of three members.

New York—Rochester

Rochester, October 13.—Officers were installed by the Rochester Dental Society at a meeting in the dental dispensary last night, and a demonstration of the work of making a lower impression in a person's jaw was made by Albert Wilbor, of New York City, who is at present conducting a post-graduate course for dentists at a temporary school in the Central building. The officers installed are: President, John T. McIntee; vice-president, John J. Scott; secretary, Howard F. Lewis; treasurer, J. Henry Carey; librarian, Edward J. Link; editor, Charles J. Pierce.

Tennessee—Tri-State

Memphis, November 10.—Promoters of the Tri-State Dental Association which concluded its first annual convention here yesterday with a series of instructive clinics, are elated at the success of the initial meeting and predict a membership for the organization exceeded by no other organization of a like character save the National Dental Association.

At the close of the clinics, officers were elected. E. H. Johnson, Pine Bluff, Ark., was elected president; H. D. Chipps, Corinth, Miss., H. D. White, Paragould, Ark., and J. H. Meeks, Humboldt, Tenn., were elected vice-presidents, and T. R. Ogden, Memphis, was elected secretary and treasurer.

Prominent dentists stated yesterday, after witnessing the clinics at the dental college, that the organization of the Tri-State Dental Association was the dawning of a new era in dentistry in the south. The forming of the association, it is said, will bring together practically all the dentists in the tri-states who will be privileged to attend the clinics each year, which will be instructive of the most modern and scientific methods in dentistry.

The program this year was entirely different from anything ever witnessed by many of the visiting dentists. According to local specialists, modern methods which look to the hygienic extraction and treatment of teeth, as well as the comfort of the patient, would have been regarded with awe by leading dentists two years ago.

The eyes of the starfish are in the tips of their "rays"

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Henley's Twentieth Century Book of
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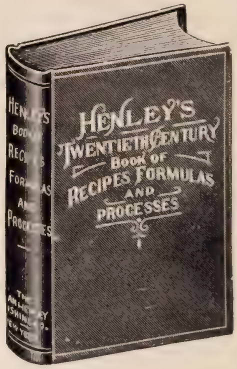

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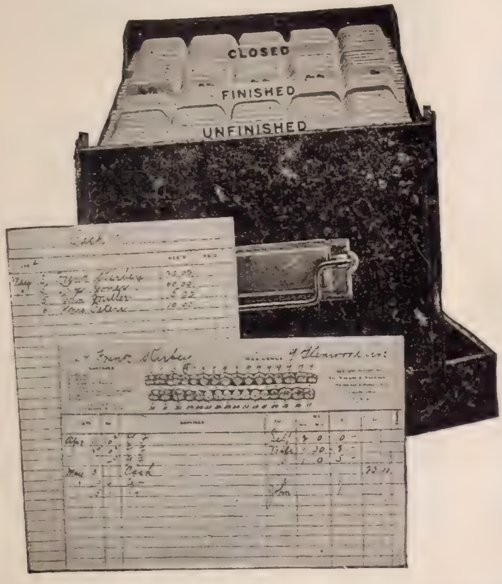
Tennessee—Memphis

Memphis, October 16.—The regular meeting of the David Mahlon Cattell Dental Society was held last night at the University of Tennessee and the following papers were read:

"Removable Bridge Work," by Joe Gronauer; "Use of Plaster of Paris," by C. W. Middlecoff; "Root Canal Work," by L. P. McKeown.

Following the reading of these papers a short business session was held at which the members discussed plans for the development of the society.



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Hard Lines for an African Student

Philadelphia, October 23.—To complete a course of study at the University, receive a degree and then have to return another year and get the same degree over again, is the plight of Dr. Jacob Lange, of Cape Colony, South Africa, who was graduated from the Dental School of the University of Pennsylvania in 1919, receiving the degree of D.D.S. When Doctor Lange entered Penn. the course in dentistry was three years; it has since been extended to over four.

Within the last two years a statute was enacted in South Africa which stipulates that any one desiring to practice dentistry in any of the colonies there, must have completed a four-year course at such universities as Harvard, Pennsylvania or Michigan, and in addition passed the state examinations given in the respective states.

Odontological

Pittsburgh, October 13.—The thirty-ninth annual fall meeting of the Odontological Society of Western Pennsylvania was held yesterday at the Hotel Chatham and was attended by several hundred members. Clinics were held in the morning, and following the business meeting in the afternoon scientific addresses were made by Doctors Hermann Prinz, Philadelphia, and R. O. Schlosser, New Haven.

In the evening a banquet was held at the Hotel Henry for the visiting delegates by the local branch of the American Academy of Dentists.

The papers read will form a part of the regular contents of THE DENTAL SUMMARY.

Iowa—Southeastern

Burlington, October 26.—The annual meeting of the Southeastern Iowa Dental Society came to a close in Burlington this afternoon following a very successful two-day session.

Miss Ota Taylor, president of the Dental Assistants' Association of Iowa, organized during this meeting, invited all the assistants to attend the state meeting which will be held in the future. The banquet was a very enjoyable affair.

The officers for the ensuing year were elected as follows: C. D. Rawhouser, of Salem, president; Will Wray, of Eddyville, vice-president; M. J. Linderholm, of Farmington, secretary; C. E. Bock, of Fairfield, treasurer; J. E. Forney, of Koekuk, delegate to the state executive council. The committees will be appointed by the president.

DENTAL ASSISTANTS' SOCIETY

In the meeting of the Southeastern Iowa Dental Assistants' Association, Miss Bessie Winders, of Burlington, was elected president; Miss Alice Peterson, vice-president; Miss H. Kietzman, secretary; Miss Glantz, of Mt. Pleasant, recording secretary; and Miss Philott, of New London, treasurer.

U. S. Public Health Service

DENTAL EXAMINERS APPOINTED BY THE BUREAU OF WAR RISK INSURANCE

Cheboygan county, Mich., Dr. A. E. Sangster, Cheboygan; Rome, N. Y., Dr. Harold E. Dorn; Red Lake county, Minn., Dr. A. E. Lucian, Red Lake Falls; Yonkers, N. Y., Dr. Victor A. Martin; Alta Vista, Ia., Dr. L. A. Kieren; Greene county, Ohio, Dr. E. J. Reynolds, Xenia; Mercer county, Ill., Dr. W. W. Moorehead, Aledo; Hibbing District, Minn., Dr. Wilbur Wring, Hibbing; Delaware county, N. J., Dr. Leroy D. Neish, Walton; Wood county, Ohio, Dr. T. M. Lea, Bowling Green; Litchfield district, Minn., Dr. A. C. Nelson, Litchfield; Davies county, Ky., Dr. O. B. Heavrin, Owensboro; Fulton county, Ind., Dr. Perry Heath, Rochester.

An attraction in the public park at Ouray, Col., is a pond containing 75,000 gold fish, of all varieties and sizes.

The chance of two fingerprints being alike is figured as one in 54,000,000.

The peak of Teneriffe, in the Canary Islands, throws a shadow fifty miles across the sea.

It is estimated that the world's railways represent one-seventh of the world's entire wealth.

The Holy Land of the Chinese is India. It is the native land of Sakya-Huni, the supreme Buddha.

Out of every twenty babies born in the British Isles, only nine ever find their way to the alter. The remaining eleven die young or unwed.

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DEATHS

At Waltham, Mass., October 26, Dr. Theron W. Temple, aged 61.

At Chicago, November 2, Dr. Hattie E. Lawrence, aged 80. She is said to have been the oldest woman dentist.

At New York, October, 22, Dr. Max Rowe. Suicide by shooting, following the murder of Dr. Ruth Rubin, also a dentist, who had refused to marry him. They were both Russians.

In the Bronx, New York city, October 24, Dr. Frank S. Hutchinson, aged 37; suicide by arsenic.

At Portland, Oregon, October 18, Dr. H. E. L. Lindsey.

At Cincinnati, October 16, Dr. Juan P. Dortiros, a native of Cuba, who had practiced at Cincinnati for twenty-five years. He was 64 years old.

At Negaunee, Mich., Dr. B. J. Miller, aged 40. Dr. Miller was about to be married. He had been called to take his place beside the bride. He replied: "I'll be ready in a minute," and immediately ended his life with a shotgun. No cause given or assigned.

At Leechburg, Pa., November 4, Dr. D. P. Trout, aged 81.

At Salem, Ohio, November 4, Dr. W. E. Linn, the result of an automobile accident, aged 50.

At Sigourney, Iowa, November 5, Dr. Harley Hinckley, aged 54.

At Chicago, Ill., November 14, Dr. Albert Cork, of blood-poisoning, aged 51.

Dental Society Meetings—1920

STATE SOCIETIES

December 10, Delaware, Wilmington.

Dates to be announced—Arkansas, Little Rock; California State; Louisiana, New Orleans; Montana, Great Falls; Oregon, Portland; Washington, Tacoma.

The province of Manitoba is bigger than England or Wales, and could by herself grow enough wheat to feed forty million people.

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